THE ENGINEERING AND MINING JOURNAL.

VOL. XVIII.—No. 26. NEW YORK, SATURDAY, DECEMBER 26, 1874. PRICE 10 CENTS PER COPY.

Deep Borings with the Diamond Drill.

A SUPPLEMENTARY PAPER, BY OSWALD J. HEINRICH OF MIDLOTHIAN, VA.

IN conclusion of a series of deep exploration-borings with the diamond drill, I beg to submit the following statements, supplementary to those in my former papers on this subject :

Since my communications read at the St. Louis meeting, in May last, I have finished two more borings, one terminating at the depth of 922 feet 7 inches, the other at the depth of 715 feet 6 inches.

The results in regard to time and expenditure have been highly favorable and fully confirmatory of my opinion as stated in previous communications, as will be seen in the following tabular statement from the journal kept in conformity with my former headings.

TABLE EXHIBITING COST AND PROGRESS OF BORING BY DIAMOND DRILL :

Mid-Lothian Colliery, Chesterfield Co. Va.	Diameter.	Total depth of boreholes	Depth bored.	Number of men in 12 h. shift.	Number of 12 hour shifts consumed.				Progress per hour.	
					For boring only.	For raising rods.	For accidental work.	Total number of shifts	For boring only.	Total progress.
No. II.	1″	922′7″	911′	3.	44.5	47.	7.5	99.	1.704′	0.76′
No. III.	2 ′	715′6″	701′	3.	33.	31.	9.	73.	1.77′	0.8′

Mid-Lothian Colliery, Chesterfield Co., Va.	Cost of labor only per foot bored.			Cost of fuel at $3 per ton coal.	Cost for other materials, repairs, blacksmith work	Interest and wear on machinery.	Total cost per foot.	Remarks.
	For boring	For outside work.	Total.					
No. II.	$0.175	$0.537	$0.712	$0.11	$0.88	$0.21	$1.91	The rocks penetrated belong to the Jurrasic and, probably, Triassic formations.
No. III.	0.144	0.508	0.652	0.057.	0.05	0.18	0.94	

These borings were executed in the same locality, through the same series of strata as formerly described. The record, therefore, varies but slightly with regard to the extent of softer and harder material passed through. It may also be mentioned that the work was carried on steadily in the manner stated in the former communications, the rods being drawn at every ten feet bored, and record being kept of the core obtained. Particular attention has also been paid to keep up and set the bit according to the instructions set forth in my former communications.

The result has been that the 911 feet hole was bored almost with the same bit without resetting. One bit was changed for a few hours only to repair it so as to keep up the full gauge ; and the perceptible wearing off of the diamonds amounted to 7c. only per foot. Almost a better result even was obtained in the 701 foot hole, this having been bored with one bit only, and the bit being still in good condition !

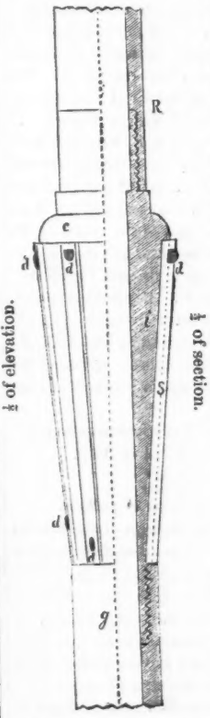
In the cost of the first bore hole, $413 06, or 45c. per foot, is charged for additional improvements not strictly chargeable to this one boring. These should properly be deducted, leaving the total cost per foot $1 46.

In commencing the first bore-hole, a stratum of very loose sandstone was struck, 18 feet from the surface, forcing nearly all the feed-water through the surface soil instead through the standpipe. Preparations were made to ream out the hole larger and tube it. But before the reamer could be procured the evil had to some extent passed away, and the boring was carried down 922 feet, although with a good deal of annoyance in consequence of washes in the hole. During this time it was also noticed that the rods had deviated from the vertical course in passing from a very hard sandstone to one of a great deal softer nature. The rods got badly hung at 117 feet depth, but were relieved by strenuous efforts with a heavy 25-foot lever. The hole was got straight again by slow boring with a newly set bit with good square edges ; no difficulty afterwards was noticed.

In the second borehole, the same difficulty with the water occurred at 35 feet from the surface. All the feed-water was lost in a similar loose stratum of sandstone, over a hard, firm siliceous rock. Having encountered so much annoyance in the former bore-hole in not being able to collect pure samples of the borings in consequence of the washing of the hole, it was at once decided to ream out this hole and tube it.

The reamer used I constructed of a solid perforated iron cone, with edged steel plates inserted all the length of the cone. The plates are dove-tailed into the cone and held tight below by the guide-rod and above by a collar plate screwed upon the cone, this being held again in place by the rods above. The diameter of the reamer was 3½ inches, and it reamed successfully even through tolerably hard siliceous sandstone, although with considerable wear of the steel plates. In softer material it worked very well. The steel plates can be easily renewed or sharpened.

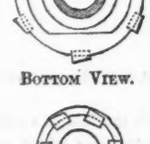
REAMER PIT, ¼ NAT. SIZE.



½ of elevation. ½ of section.

d, d are diamonds which may be used in harder rocks, particularly the top ones to keep up the gauge of the hole. *s, s*, steel plates. *i*, iron bit. *c*, collar plate screwed on. *g*, guide pipe. *R*, Rod.

TOP VIEW.



BOTTOM VIEW.

This tool, I think, would be found useful in all softer materials, even for boring where larger holes are required. If set with diamonds upon the steel plates, I think it would offer a better tool for boring larger holes with the aid of the diamond drill than the bits now used, so far as I know, for that purpose.

The diamonds would have to be set in spiral lines up the reamer, either covering, as it were, all the surface in their rotation, or leaving the steel plates to aid in cutting on vacant spaces left between, so far as they could do this without being too rapidly worn out.

Where it is desirable to obtain a core at the same time and to increase the diameter of the bore hole also, I think this bit will answer better than a larger annular bit, as it will be difficult in hard rock to construct a core-lifter which will break off the core without danger.

I have not yet had an opportunity to test the instrument further than is referred to above ; but I would not hesitate to do so under circumstances requiring it.

Returning again to the ultimate success of reaming the hole in question, I can only add that it was done to the depth of 40 feet, and a standpipe with seed-bag at the bottom was placed in the hole, being also made fully water tight above by dry moss compressed around it.

During the time of reaming the hole, the reamer passed 12 feet down without assistance through a 2-inch hole bored, thus giving full evidence of considerable washing in softer materials.

This all confirms me in the opinion formerly expressed, that in instances where softer rock in very thick strata is to be encountered, the diamond drill is not preferable, and can be replaced by other tools which allow the necessary tubing to be more readily performed. It may, in instances, be even better to alternate with drop tools or rotary tools of different constructions, according to the difficulties presenting themselves.

But in hard rock, or the firmer rocks of sedimentary origin, and where the softer materials only occur in moderately thick strata, I am still more constrained to be a firm advocate of the diamond drill, as the cheapest and most expeditious system of boring deep holes.

* Read before the American Institute of Mining Engineers at Hazleton, Oct. 28, 1874.

Cryolite.—JOHN B. WINTERS is said to have discovered a field of cryolite, 60 miles north-east of Reno, Nevada. Cryolite is a substance of white or yellowish gray color, occurring in masses of a foliated structure. It is a double fluoride of aluminum and sodium, and there are large deposits of it in Greenland. It is employed as a raw material in the manufacture of aluminate of soda, which is available instead of caustic soda in the repurification of fatty matters. It is also used in making a porcelain like white glass, and various valuable chemical products are obtained from it.

The Workable Depths of Coal and the Cause of Explosions.

At the last meeting of the Manchester Geological Society, the President, Prof. W. BOYD DAWKINS, in his inaugural address, made the following remarks on the above subject.

It is generally considered the duty of the President, in taking the chair, to deliver an address, either on the progress which has been made by the science which he represents, since the last session, or on some department of special research in which he himself is more particularly interested. The inexorable demands on my time forbid, alas, the performance of either of these duties fully and thoroughly. I shall, therefore, merely give a short analysis of the most important additions to our knowledge since the last session, which occur to me in those departments of the many-sided science of geology, that relate to mining, engineering, and terrestrial physics.

Since the delivery of the last address, two facts of considerable value in coal mining have been ascertained. It will be in the memory of those who read the Report of the Coal Commission of 1871, that the limit of the depth at which coal could be worked was fixed by the temperature of the blood, or 98 deg., at which, according to Dr. BURDON SANDERSON, "labor is not practical, except for very short intervals, in the moist air which is generally met with in mines." The Report stated that, "the evidence having shown that the question of maximum temperature under which work could be carried on in a coal mine, hinges in a great measure on the hygrometric condition of the air, the committee proceeded to inquire what was the state of the air in regard to moisture in coal mines? The observations which they collected on this point show that the air at the working faces of the coal was always humid, and often saturated with moisture. In general, however, the deepest collieries appear to be the dryest, although there does not appear to be any ratio between depth and dryness. The depth at which the temperature of the earth would amount to blood heat, or 98 deg., is about 3,000 ft. Under the long-wall system of working, a difference of about 7 degs. appears to exist between the temperature of the air and that of the strata at the working faces; and this difference represents a further depth of 420 ft.; so that the depth at which the temperature of the air would, under present conditions, become equal to the heat of blood, would be about 3,420 ft. Beyond this point, the considerations affecting increase of depth and temperature become so speculative, that the committee felt it necessary to leave the question in uncertainty; but, looking to possible expedients which the future may elicit for reducing the temperature, they considered it might fairly be assumed that a depth of at least 4,000 ft. might be reached."

The deepest workings which afforded data in coming to this conclusion were:—

The Pendleton Pit	2,214 ft. deep.
The Rosebridge Pit	2,376 "
A colliery near Charleroi, in Belgium	2,640 "
A colliery at St. Gilly	3,000 to 3,280 ft.

The last of these had been abandoned, though not on account of the heat at that depth. Since these facts were brought before the commissioners another Belgian mine has been successfully carried to a greater depth than any of the above. I am informed by my friend Mr. HUNT, F.R.S., that the colliery at "Echelles de Simont Lambert du Charbye des Vivières" was 1,040 metres, or 3,511 ft., deep about three years ago. Thus the limit of 3,420 ft. has been already surpassed, without, so far as I know, any unusual difficulty having arisen from the temperature of such a nature as to cause the adoption of extraordinary means of ventilation. It seems, therefore, very probable that the difficulties offered to the sinking of mines at a greater depth even than 4,000 ft. can be overcome by the genius of our engineers, and that by means of increased ventilation and the widening of the shafts, the temperature may be reduced so as to allow coal being worked considerably below the limit chosen by the commissioners in their estimate of the amount of coal available in this country. At all events, it is satisfactory to know that in Belgium coal is being worked now at a depth greater than any of our collieries by more than one thousand feet.

On this question, it is interesting to note in the last *Athenæum* that the Prussian engineers have bored, at Sperenberg, twenty-five miles south of Berlin, to a depth of more than 4,040 ft. in the saliferous rocks, which they struck at a depth of 283 feet.—*Iron.*

Ponsard Gas-Furnace.

M. PERISSE has read a communication before the Society of Civil Engineers of Paris on the gas-furnace of M. PONSARD.

The furnace consists essentially: 1. Of a gazogène, in which the fuel in a solid state undergoes incomplete combustion or is transformed into gases which are themselves combustible; 2. Of a hot-air apparatus, heated by the lost flames, called by its inventor a *heat recuperator*, and placed below the furnace proper; 3. Of what is called a furnace-laboratory, in which the gases from the gazogène are submitted to complete combustion by means of the hot air from the recuperator. There are two forms of gazogènes, one fed with hot and the other with cold air. The principal applications which have been made at present of this system of heating are: the heating and welding of iron, the fusion of steel and cast iron, the re-heating of steel, puddling of iron, treatment direct of ores of iron and of zinc; glass bottle, gas, and chemical manufactures; and the heating of steam boilers. The first of these applications was dwelt on specially, and the results obtained with five such furnaces were detailed:

A furnace at the Basacle forge, at Toulouse, belonging to M. Pelegreg. This apparatus was described as having been in work for two years, producing an economy of 50 per cent. in fuel, and a saving of one-third or one-quarter of the whole. It produces of itself 30 per cent. more than two ordinary furnaces. A reheating furnace at the works of M. DEVAX-IBLED, at Vieux Condé, in the department of the Nord, which had been at work for fifteen months without undergoing material repairs; with the ordinary furnaces 2 cwt. of nuts require 115 kilos. of coal for their manufacture, but with the Ponsard furnace 53 kilos. only. The saving in waste is estimated at about one-half. Three furnaces in Italy fed with lignite; two of these are at San Giovanni, in the valley of the Arno, with two puddling furnaces and three boilers, in all, seven apparatus heated by the same system; the other is at the small works at Mamianno, in the Appennines. The weight of the lignite consumed in the production of a ton of iron is about the same as that of coal in French furnaces. The application of this inferior fuel is an important fact.

M. PERISSE then took up the purely scientific question arising out of the subject. In the first place he showed what was the composition of the gases produced by the gazogènes from coal, coke, charcoal, lignite, peat, &c. Taking the analyses and experiments of BERTHELOT as his starting ground, he showed that the gas produced by the incomplete combustion of coal contained not only carbonic oxide, carbonic acid, and nitrogen, but also a strong dose of hydrogen mixed with acetyline and other gaseous hydro-carburets.

M. PERISSE, comparing the quantities of heat lost and utilized in the gas furnaces of SIEMENS and PONSARD, claims for the latter a superiority over the former amounting to 5 or 6 per cent. in the economy of fuel when the ordinary gazogène is used, and from 10 to 13 per cent. when the gas is produced by means of the hot blast from the recuperator. And, in addition to this, the Ponsard furnace costs less than half as much as the SIEMENS'. Another economy in these gas-furnaces is the saving of about 40s. a day in the saving of waste iron.

The subject is summed up in the following terms:—With the SIEMENS' or PONSARD gas-furnaces higher temperatures are obtained with regularity than with other furnaces. The causes of their superiority consist in the facts, that the fuel and the metal are in the same physical condition, their initial temperature, the possibility of mixing them in the proper theoretical proportions without admitting any notable excess of air, the possibility, also, of making such combination at the very point where it is required, and that at a light pressure which preserves the laboratory of the furnace, and the matters contained in it from the chills and alterations caused by the entrance of the outer air.

The rapidity of heating depends evidently on the excess of the temperature of the flames as compared with the temperature to which the substances must be raised, so that in these gas-furnaces we have at once a larger production with an important economy in fuel, independently of that which results from recuperation.

Still, the full effects of high temperatures have not yet been obtained, and can only be so when a high pressure can be maintained in the laboratory of a gas-furnace constructed of sufficiently refractory materials. A continuous struggle is going on between the fire, whose most violent manifestations are excited, and the refractory material adopted to contain and master it.—*Iron.*

Coal in Patagonia.

M. LE VICOMTE G. DE SUZAINNECOURT, member of the Paris Scientific Association, arriving from Chili, has communicated a very detailed account from M. FREDERIC ARNAL, engineer of the French mines, of the discovery made, about the month of May in this year, of a rich coal mine, situated in the extreme South of Patagonia, near the Isle of Brunswick, on Magellan's Strait, at the place called Vaqueria del Capitan Corey, not far from the Chilian colony, Punta Arenas (53 deg. 9' 40" S. lat.; 73 deg. 13' 46" W. long.) This property, granted to three French explorers, Messrs. BOUQUET, civil engineers DERUÉ, and G. de SUZAINNECOURT, by the Chilian Government, has an area of 975 hectares, but it could easily be quadrupled.

The strata which have been examined are to the number of three, and lie east and west, with a slight inclination towards the North. The lowest bed is about 75 metres above the sea level. The apparent thickness of this first stratum is at least 2 metres; that of the second bed is from 1·80 to 2 metres, and its altitude is 50 metres above the first; the third bed is 40 metres higher than the second, and its thickness about 5 metres, divided into three veins of very nearly equal thickness, separated from one another by soft schist of a medium thickness of 20 to 30 centimetres. At another place, about 600 metres from the first places examined, in a deep ravine, the coal appeared in a single stratum of from 14 to 15 metres thick, divided into five veins by the soft schist mentioned above. Positive information authorizes the belief that well-conducted adits would open up new beds perhaps richer than those already known, and probably giving coal of a very superior quality.

At 4 kilometres to the West, the same coal is discovered in very thick layers. It is found, besides, everywhere where the earth, separated into natural trenches, permits a sight of the materials it contains. The entire property, and its environs, then, certainly contains a coal-basin of the greatest richness. The quality of the coal could not be regularly analyzed for want of sufficient apparatus; but that exposed to view belongs to the class of lignites. It is of superior quality, very compact and very black; it easily takes fire, and burns without any sensible smoke or odor.

As has been said above, the total height of the beds is about 8 metres, and the area of the property is 975 hectares, or 9,750,000 superficial metres. The apparent amount of coal contained in the three beds is thus 9,750,000 multiplied by

8, which gives a product of 78,000,000 cubic metres. In giving to the cubic metre the weight of 1,500 kilogrammes, the number 117,000,000 is arrived at for metric tons. It may also be remarked that the bed of 5 metres being the same as that of 14 metres, discovered 600 metres to the West, these numbers are much below the reality.

The mine is situated between Magellan's Strait and a vast bay known on English and French marine charts under the name of Otway Water. The distance of the mine from this bay is about 6 kilometres, and 17 kilometres from the Strait. The bay appears to be little favorable to navigation; it would then be advisable to neglect this channel and keep to the Strait, which would have the bay Laredo as a point of arrival, being vast, deep, of sure anchorage, and known under the name of Cabo Negro. The coal mine has been named Mina Rica (rich mine).—*Iron.*

Coal in Russia.

IT appears that the Russian coalfields are really of much greater extent than they have hitherto been supposed to be. The principal one begins in the district of Tula, south of Moscow, and continues in a north-easterly direction to the shores of the White Sea, where it becomes very narrow. This field covers an area of 13,000 square miles, and includes two seams of coal, one 3 ft., and the other 7 ft. in thickness. Next to this in point of extent is the coalfield of Demity, situated in the country of the Cossacks of the Don, on the shores of the Sea of Azoff; here the area is 11,000 square miles, and it contains many seams of vast aggregate thickness. The coal is within easy reach of the surface, and is both bituminous and anthracite, the same seams being bituminous in one place and authracite in another, resembling in this respect the coalfields of South Wales. No fewer than sixty seams have been discovered in this district, of which it is believed that forty-four, having a total thickness of 114 ft., are workable. The chief seams are 3 ft., 3 ft 7 in., and 5 ft. 7 in. in thickness, and the depth of the pits is from fifty to eighty yards. The coal contains about 89 per cent. of carbon. A third coalfield extends in a long narrow strip at the base of the Ural Mountains, in which beds from 30 to 40 ft. in thickness are actually being worked. The coal in this district is of a soft friable nature, and throws out a great heat. The peculiarity of the whole of these coalfields is that none of them belong to the true carboniferous series; indeed, the only coalfield which can be assigned to the true coal formation is a small tract, about eighty square miles in extent, in Poland. In the year 1872, the total quantity of coal raised in Russia was 817,000 tons, and one-third of this quantity was obtained from this small Polish basin. The average rate of wages paid to miners in Russia is 10s. per week of sixty-six hours, or eleven hours per day. The necessities of the rapidly-increasing railway system in Russia, which now extends to 8500 miles in actual operation, will compel a rapid and large development of the Russian coal measures. In view of these extensive fuel resources, and the rich mineral deposits that are so abundant in that country, it can only be a question of time and the educational growth of its population before Russia can be independent of foreign support.—*Colliery Guardian.*

The Kohler Refining Works and the Product of Base Bullion in California.

WITHIN the course of a month the works of the Kohler Reduction and Refining Company, situated at Oakland, will be completed and ready for operation, these being the most, and, in fact, the only complete and extensive works for the refining of lead bullion ever erected on this coast. Connected with this establishment will be a branch for the manufacture of white lead, also the first ever founded here, it being the intention of this company to utilize their entire product of lead this way. Through the enterprise of this company then we shall have two new and important industries simultaneously planted in our midst, either of which, by attracting to this point the product of the smelting furnaces of Central Nevada, and by supplying our home wants with a costly article of large consumption, now mostly imported from abroad, will be the means of increasing the demand for labor, while it serves to retain large sums of money in the country that have heretofore found their way into the pockets of eastern and foreign manufacturers.

The business of ore smelting is beginning to attain to large proportions in the State of Nevada, the out-put of base or lead bullion from the furnaces in the Eureka District alone being estimated at 20,000 tons, valued at $4,000,000 for the past year; and yet the business is in its infancy there, merely foreshadowing the importance it will be likely to reach in the early future. The whole of this bullion is now sent East, the most of it going to Chicago, Newark, and Boston, for separation and refining. The distance from Eureka to San Francisco is 658 miles, while the distance from that place to Chicago is about 2000, and to either Boston or Newark, a little over 3000 miles, indicating how likely this bullion would be to come West to tide water if only we had here facilities for converting it readily and cheaply into a commercial commodity. A few years ago, when ore-smelting was first commenced at Eureka, the furnacemen sent their bullion to this city, but failing to meet with a satisfactory market, the practice was soon discontinued. The Selby Smelting Works in this city have always obtained the bulk of their base bullion from the Cerro Gordo mines, only enough of it having been refined to supply material for the shot and lead-pipe factories of the proprietors, while the balance and major part of the crude bullion turned out here was shipped to New York.

With the establishment of the Kohler Refining Works, which are said to be as perfect as any in the world, we may reasonably expect that the base bullion from Eureka, and indeed from all parts of Central and Western Nevada, will come here for sale or treatment, as the saving in freight and time, owing to diminished distance, must be enormous. The magnitude to which the business of producing this bullion, so compounded of gold, silver, lead and other of the baser metals, is destined soon to grow, may be calculated from the abundance of the ores and the rapidity with which it has sprung up in this one district, which but a few years ago was without a furnace or even an inhabitant. During the past year, a single company, the Richmond, operating at Eureka, have extracted from their mine 31,000 tons of ore, yielding 10,400,000 pounds of bullion, valued at $1,750,000, their monthly profits now aggregating over $60,000. And yet this company have hardly more than scratched the surface of their mine, from which double the quantity of ore will be raised the coming year; and yet this is but a single mine in a district showing equally heavy ore-bodies at many other points. Not only so, but there exist in the Tybo District, lying in the same range of mountains further south, even more valuable deposits of these smelting ores than have yet been found in Eureka, or, indeed, at any other point in Nevada. These ores are of an extremely high grade, several large lots gathered from the surface having yielded in the works at Austin from three to five hundred dollars per ton. An English company have lately purchased several of the most promising claims in Tybo; among others the mine known as the "2 G.," the most largely developed and promising of any in the district. They have already put up a furnace and freighted in a large mill, for they have both milling and smelting ores, and are proceeding, after the manner of that people, in a quiet way to lay the foundation for a great success, the probabilities being that better profits will ultimately attend investments here than in Eureka itself. With these prospects for a large and continuously increasing production of lead-bearing bullion, there can be little doubt that the new refinery will be kept fully employed and its proprietors meet with ample reward.—San Francisco *Commercial Herald.*

Ores of Nickel and Cobalt.

AN exhibition of enamels, gems, &c., of very considerable interest has been held, during the last week or two, in the establishment of Messrs. MACKAY, CUNNINGHAM & Co, the well-known goldsmiths, jewellers, &c., Edinburgh. One of the most interesting features in the display, perhaps, is the collection of a variety of nickel ores, from which forks and spoons are manufactured, together with specimens of the nickel in every stage, from the rolled plate to the finished article, ready to receive its deposit of pure silver by electricity.

The exhibitors supplied some interesting notes on nickel and cobalt ores, which may be regarded as embodying the most recent information on the subject. The ores of nickel and cobalt, they say, are found in almost all parts of the world where other minerals exist, but chiefly in Norway, Sweden, Hungary, and South America. The mineral containing nickel which Norway and Sweden produce, is an iron pyrite, and in most cases magnetic, which also contains copper, but is nearly free from cobalt. These ores are exceedingly poor, and never contain a higher percentage of nickel than 3 per cent. They are in some cases worked as low as 1 per cent., or even ½ per cent. of nickel, but the labor upon them is so enormous that they can only be obtained at the present high price of refined nickel. The nickel ores are found abundantly in Hungary, where the nickel is always in association with cobalt. The ore generally contains about 15 per cent. of the former metal, and 5 per cent. of the latter. This is a very valuable mineral, and the mines have been worked profitably for the last thirty or forty years. The ore is composed of an arsenical mundic, highly impregnated with the more valuable metals, and in this respect differs from the Norwegian and Swedish ores, insomuch that the latter contain little or no arsenic, and appear simply as sulphides. The nickeliferous minerals which are obtained in South America are altogether of a different character, and exist generally in the form of basic oxides, or as combinations of basic oxides and arseniates in association with large quantities of earthy matter. These ores are seldom very rich in metals, nickel, or cobalt, but are sometimes found to contain as high as 15 or 20 per cent. This is very rarely the case, however, and at the present time such ores would be very valuable. The mines which yield these ores are not permanent, like the Hungary or Sweden mines. The ore exist in pockets near the surface in the vast tract of country known as the Desert of Atacama. The place is very inaccessible, and large supplies cannot be expected from that district.

After the ores are brought to this country from the various parts of the world, they are submitted to a long and expensive process of smelting, which first brings them into a coarse metal or speiss, and afterwards into a rich speiss, containing 50 or 60 per cent. of nickel and cobalt. This is subsequently refined by chemical means, and finally the nickel and cobalt are parted, and each is obtained in a pure form. The cobalt is used for staining the rich blue color upon pottery-ware and glass, and large quantities of it are employed annually for this purpose. The nickel, which is a hard, whitish metal, almost resembling steel, is used for various purposes in the arts and manufactures, but chiefly in the production of a cheap and useful alloy known as German silver, an alloy consisting of nickel, copper, and zinc, which is employed in some cases as a substitute for silver, but chiefly as a medium for the reception of electro-plate. Being a very white metal, when made of good quality, it answers admirably for the manufacture of articles in general use, and during the last twenty years has become so generally fashionable and so desirable as to form a very important feature in the manufactures and produce of this country. Nickel has also been employed latterly for the purposes of coinage, a fashion which is growing into favor, as the metal imparts to the coins all the desirable qualities of whiteness and durability.

During the last few years a process has been devised for depositing nickel by electrical or galvanic means, and a company has been formed to work the patent; and it is very probable that soon many of the iron and steel articles which rust in general use will be coated with nickel, so as to add to their lustre, and preserve them from the oxidizing action of the atmosphere.—*Iron.*

THE ENGINEERING AND MINING JOURNAL.

NEW YORK, SATURDAY, DECEMBER 26, 1874.

ROSSITER W. RAYMOND, Ph. D., RICHARD P. ROTHWELL, C. E., M. E., } Editors.

The Engineering and Mining Journal is devoted to Mining, Metallurgy and Engineering. Communications on these subjects will always be welcome.

It is the Official Organ of the American Institute of Mining Engineers, and it alone publishes the valuable papers read before that influential society.

Correspondence and general communications and books for review should be addressed to the Editors. Business communications should be addressed to the Secretary.

Remittances should always be made by Post-Office Orders or Bank Drafts, made payable to WM. VENTZ, Secretary.

Subscription $4 per annum; $2.25 for six months, in advance.

Advertising Rates. Inside pages 25 cents per line each insertion. Outside pages 40 cents per line. Special reduced rates will be given on application for advertisements extending over a long time or occupying a large space.

The Postage on the ENGINEERING AND MINING JOURNAL, from January, 1875, will be paid at this office. We shall make no additional charge to our patrons on that account, but the subscription price will remain as heretofore, Four Dollars.

THE SCIENTIFIC PUBLISHING COMPANY.
WILLIAM VENTZ, Secretary,
P. O. Box 4404. 27 Park Place, New York.

CONTENTS FOR THIS WEEK.

Deep Boring with the Diamond Drill..... 401
The Workable Depths of Coal and the Cause of Explosions..... 402
Ponsard Gas-Furnace..... 402
Coal in Patagonia..... 402
Coal in Russia..... 402
The Kohler Refining Works and the Product of Base Bullion in California..... 403
Ores of Nickel and Cobalt..... 403
EDITORIALS:
The Fabulous Riches in the Comstock Lode..... 404
The Deepest Sinking in the Anthracite Regions of Pennsylvania..... 404
Prof. Marsh's Discovery of Interesting Fossils..... 405
New Publications..... 405
Chrome Iron..... 405
Comparative Shipments of Anthracite Coal to Tidewater for the Years 1873 and 1874. 406
Coke Ovens at Blast Furnaces..... 406
The Cause of Earthquakes and Volcanoes. 406
The Coppee Coke Oven..... 407
COAL TRADE REVIEW..... 407
Review of the British Coal and Iron Trade 409
IRON MARKET REVIEW..... 409
Miscellaneous Stock Market..... 410
Boston Stock Market..... 410
San Francisco Stock Market..... 410
American Institute of Mining Engineers—Official Bulletin..... 410
Advertisements..... 410

SUBSCRIBERS to the ENGINEERING AND MINING JOURNAL who do not receive the paper punctually, will confer a favor by advising us at once of the fact, in order that we may take the necessary steps to correct the irregularity.

The Fabulous Riches of the Comstock Lode.

NO CHAPTER in the "Arabian Nights" could equal the marvelous stories of incalculable wealth discovered, from time to time, in the great gold and silver mining districts of the Pacific Slope. The last excitement is over the proving of an immense "bonanza" in the Comstock lode, on the properties of the Consolidated Virginia, the California and the Ophir Companies. The shares of these companies have risen enormously, and the San Francisco stock market is wild with excitement. Some idea of this may be gained from a comparison of the value of Consolidated Virginia during the past three months. The beginning of October, it sold for $92; by the 5th of November, it had advanced to $120; the 3d of December, it had reached $182; 10th of December, $225; 17th of December, $290; 22nd of December, $500. Enormous quantities of stocks have changed hands; one firm is said to have made $30,000,000 during five days, and one operator is reported to have cleared over $10,000,000 in the same time. Senator JONES, of Nevada, is said to be one of the fortunate dealers in these stocks. The Consolidated Virginia has 1,150 feet on the lode, and at the present value of the stock, the mine would be worth about $50,000,000.

The following notes, compiled from the San Francisco *Scientific Press*, and the San Francisco *Chronicle*, would appear to leave no doubt of the genuineness of the discoveries that have been made, though, of course, such estimates as $300,000,000 for the value of the ore in this "bonanza" is merely a wild guess.

As most of our readers are doubtless aware, the yield of ores of the Comstock rarely exceeds $50 per ton, and, probably, $15 per ton would be near an average. The yield from the twelve principal companies working on this lode in 1872 was $13,569,724, and the average yield of the ore extracted, which gave $12,000,000 of this, was $19 60 per ton:

"The recent wonderful developments on the Comstock are far ahead of anything before made on that famous lode. The great *bonanza* or ore body running through the Consolidated Virginia, California and Opyhir mines seems to be improving in all directions. The general character of the ore is the same as in all mines—being a mixture of red chloride and sulphuret ores. The California mine has come suddenly forward as the richest mine on the Comstock, and Belcher and Crown Point, producing over a million a month, are thrown into the shade by the developments in the mine above mentioned. Mining experts who have visited the lower levels place most astounding estimates on the amount of ore in sight. Some of these estimate that in the Consolidated Virginia there is standing in the mine above the 1550-foot level, over $43,000,000 worth of ore, or about $27,000,000 in dividends. The estimates of the value of the ore in the California vary from $50,000,000 to $150,000,000.

"Plenty of ore is found in the Consolidated Virginia, assaying on an average $600 per ton. At one place the ore body is found to be 140 feet wide. No ore has come from the lower levels but what has been taken from the winzes and levels, it being almost all virgin ground. The body of ore developed by the drifts, cross-cuts and winzes of the 1500 and next lower level is as yet totally undetermined as to the extent, no limit having been reached in any direction. The development, toward the north, of the ore bodies on the 1300 and 1400-foot levels is constantly furnishing results of increasing value.

"In the California mine the discoveries are attracting universal attention. About a week ago, the north drift on the 1500-foot level was connected with the south drift on the same level in the Ophir, thoroughly ventilating the mine and creating a fine circulation of air. Cross-cuts have been commenced on both the 1400 and 1500-foot levels to protect the ore vein. The Virginia *Chronicle* says it is simply the continuation of the sulphuret and chloride ore body of the Consolidated Virginia, to the northward. This, taken together with the fact of the southward body of ore in the Ophir butting square against the California line, and extending downward from the 1300 to the 1465-foot level, and that the cross-cut from the bottom of the south winze on the south line of the Ophir, 60 feet below the 1465-foot level, is developing a more valuable body of ore than anything yet found in that section, no longer leaves a doubt that the California has one of the richest and most extensive ore bodies ever discovered on the line of the Comstock.

"The ore in the Ophir is the same as that in the Cons. Virginia, showing that both companies are at work on the same body. On the 1465-foot level the *bonanza* is constantly expanding, and the value of the ore is almost daily increasing. It is estimated by those who have taken the pains to make the necessary measurements that there are now in sight on the 1465 and 1300-foot levels of the Ophir not less than 150,000 tons of ore. The *Enterprise* says that recently a great and almost stunning strike has been made in a drift near the north line of the California. A winze was sunk on the line to the depth of 35 feet, from the bottom of which a drift was run in a northwest direction a considerable distance in excellent ore. They then came back to within 25 feet of the winze and started a drift south toward the California. This drift is now in about 15 feet and is in the richest ore seen on the Comstock in many years; indeed, the only ore of the kind ever found before was in the old Mexican mine. Specimens are here found that are so pure as to be malleable on some of their surfaces. A specimen taken out here on Saturday assayed over $8,200. It is thought that the ore in this drift will average $1,200 per ton. At last accounts, last evening the face of the drift was in the same material.

"The first result of these strikes has been a very exciting time in the mining stock market in this city in Comstock shares. From all appearances the old Comstock is likely to last many a long year and pan out its millions regularly. As one mine gives out another comes to the front, and each richer than the other."

The Deepest Sinking in the Anthracite Regions of Pennsylvania.

FOR many years the Dundee shaft, in the Wyoming Valley, was the deepest sinking in the anthracite coal-fields. It reaches one of the higher beds of coal at a depth of 810 feet from the surface, or 260 feet below the sea level. The sinking of the Philadelphia and Reading Coal and Iron Company at the Norwegian, or, as it is more generally called, the St. Clair shafts, in Schuylkill County, was expected to find the Mammoth vein at a depth of 1,500 feet from the surface. As nothing is easier than to find ourselves astray in our calculations as to where any given bed will be found in the anthracite basins, we are not greatly surprised to learn that the actual distance to the bottom of the Mammoth vein is now proved to be 2,076 feet.

We have several times referred to this sinking, which has attracted much attention on account of the novel use of the Diamond Drill in shaft sinking, first applied in it.

"When the shaft had been sunk to the depth of nearly 1,200 feet, it was resolved to drill a test hole with the diamond drill, to find exactly how the veins of coal were situated. This work went quietly on for several weeks, until last Friday, when the Mammoth vein was reached.

"Gen. PLEASANTS' original calculation was, that the Mammoth vein could be found at a depth of about 1,500 feet. The actual distance from the surface of the earth vertically down to the Seven Foot vein, the twin vein to the Mammoth, is 1,909 feet. The discrepancy is accounted for by the singular formation of the veins of coal as developed by the test drill. The big Tracy vein basin is found to be 167 feet deeper than expected. And the Orchard vein is so curiously formed that it was cut three times, the distance from its first appearance to the last being 250 feet. The strata overlap or closely fold in a very remarkable way.

"The Seven Foot vein, which is the upper member of the Mammoth, was found to be 13½ feet thick, and of excellent coal. Underneath this vein there are 7 feet of slate, 3½ feet of good coal, 4 feet of slate, 2 feet of good coal, 16 feet of slate containing iron ore balls and 6 inches of carbonaceous iron ore, or Black Band. Then comes the Mammoth vein 21 feet thick; next, 1½ feet of partition slate, and under this, it is thought, there is a 9-foot vein of coal.

"Besides the upper Red Ash vein, which will be worked, and of which no mention has been made in this article, there are the following white and gray ash coals: Primrose, 14 feet thick; Seven Foot vein, 13½ feet thick; and the Mammoth, 21 feet thick; making a total thickness of 48½ feet of coal."

The above extract, from the Pottsville *Miners' Journal*, tells how the depth

comes to be over 2,000 feet instead of 1,500; and to those familiar with the curious contortions and mysterious foldings of the anthracite coal measures, the explanation is quite natural, and the miscalculation of the depth does not throw the least discredit on the able and accomplished engineer who had charge of the work.

This will be the deepest sinking in our anthracite fields, and the enormous quantity of coal proved will make it one of the most important collieries in the country, and one of the largest in the world. It is expected that 1,500 tons a day will be the output at these shafts.

Prof. Marsh's Discovery of Interesting Fossils.

PROF. O. C. MARSH, of Yale College, recently made an important and somewhat dangerous expedition in the "Bad Lands," south of the Black Hills, in Dakota Territory. The opposition of the Indians, who were collected in great numbers at the Red Cloud Agency, the point of departure of the expedition, and the intense cold were not sufficient to cool the enthusiasm of Prof. MARSH in his great bone hunt, and the results obtained were very gratifying. The following extract from a New Haven correspondent of the *N. Y. Tribune*, gives, on what appears official authority, a brief description of those interesting discoveries:

"The bones obtained are those of tropical animals, of the Miocene era. There are nearly two tons of these fossils; most of them are rare specimens, illustrative of entire classes of quadrupeds, of which all that is known has been ascertained within a very few years; some of the bones are those of animals entirely new to science. The brontotherium is one of the larger quadrupeds whose remains are entombed in the bed of this Miocene lake. It was as large as an elephant, and bore a general resemblance of form to that animal, but differed in many essential particulars. Its shorter limbs were like those of the rhinoceros; its nose was adorned with a pair of huge horns, placed crosswise. Its skull is a yard in length. It had no tusks, or long proboscis, such as the elephant possesses; but its nose was probably elongated and flexible, like the snout of a tapir. In fact its head and neck were so long that it had no need of an elephantine proboscis. These animals must have lived together in herds. Probably their remains were washed into the lake by a freshet, and thus were buried in the mud with which the lake was finally filled, which now has hardened into stone. Among other remains found are those of animals nearly allied to the rhinoceros, the camel and the horse of to-day. The stratum in which the fossils lay was of the lowest Miocene, and could only have been reached by the upper Miocene and the Pliocene above that having been washed away by a water-course in this gully. Hence the locality of the deposits was narrow, and the expedition was able to get at and remove them entirely. A careful examination of the surrounding region showed that nowhere else had any watercourse cut deep enough to lay bare this stratum.

"Aside from the novel points obtained concerning specific fossils, the expedition has made an important determination respecting the geology of the region. The fact was ascertained that the Miocene lake was of more limited extent than has hitherto been asserted, although larger than all the great lakes of the North West at the present day would be if combined in one. Its northern limit was the southern slope of the Black Hills; its western margin the Rocky Mountains; its southern limit near the nothern line of Kansas. Long after this lake was filled and dried, another tropical lake covered the same region, having the same boundaries at the North and West, but extending southward even to Texas. The sands and clay deposits of this more recent lake basin are of the Pliocene age; they are of great thickness, in some places not less than 1,500 feet. No inconsiderable part of the beds which Prof. HAYDEN has regarded as belonging to the Miocene or Lower Lake formation proves to be of the Pliocene or Upper Lake, the Miocene being only visible in occasional depressions where the Pliocene has been washed away. All, or nearly all, the high table lands from the White River to Arkansas are formed of the deposits of the Pliocene lake; it has proved rich in organic remains, especially in fossil horses; but all the animals found in it differ from those of the lake below as well as from those now living. Many obscure and some contested points in science will be determined by the material which Prof. MARSH's expedition of 1874 has gathered."

NEW PUBLICATIONS.

North German Geology.

WE have received from Professor HERMANN CREDNER, Director of the Geological Survey of Saxony, a systematic catalogue of the geological and mineralogical literature of that kingdom and the adjacent territory, prepared by Dr. ALFRED JENTZSCH, an assistant of the survey. This work, containing the titles of 2438 books and monagraphs, is a monument of industry, thoroughness, and skillful arrangement. It comprises a complete alphabetical index of authors, and a list of their writings on the subject under consideration, classified in such a way that the student in any branch of geology or mineralogy, upon which light has been thrown by the labors of investigators since 1835, in the various formations of Saxony, Thuringia, Bohemia, etc., can see at a glance the sources of information and follow the progress of discovery. Beginning at about the date with which the catalogue given by FREIESLEBEN in his *Oryktographie*, it brings down to 1873 the survey of scientific literature, which that author traced almost from its commencement; and while it is calculated to be most directly useful to the scientific public of the country in which it is issued, it constitutes a guide to the geologists and mineralogists of all countries, the value of which cannot fail to be universally recognized. Incidentally it furnishes, also, an indication of the splendid thoroughness with which the new geological survey of Saxony is prosecuted by its enthusiastic and industrious director, Dr. CREDNER, whose eminent qualifications for this work have been supported by such liberality on the part of his government, as to give good reason for expectation that its execution will surpass anything that has hitherto been accomplished in this direction by other states. The comparatively small size of the Kingdom of Saxony, and the vast amount of labor which has already been expended in the study of its geognosy and mineralogy, as well as the development of its mineral resources, permit, no doubt, a much more minute and accurate presentation of these features than would be possible in larger and more recently settled countries; but the same circumstances greatly increase both the amount and the difficulty of the labor required in digesting and arranging such a mass of material. The highest qualities of judgment and skill in classification are demanded for such a task, and we are glad to know that it is in hands so competent. The government of Saxony, wisely abandoning the attempt to maintain full political and military independence, and resigning itself to the more reasonable, if less conspicuous, position of a State of the German Empire, has developed an extraordinary zeal for science and education, and bids fair, by its system of popular education, by the excellence and prosperity of its universities and technical schools, and by its munificent support of science, to acquire an eminence in the industrial and intellectual world, which it could never have attained in the spheres of war and diplomacy.

The Report of the Geological Survey of the State of Missouri, including Field Work of 1873 and 1874, with ninety-one Illustrations and an Atlas, by GARLAND C. BROADHEAD, State Geologist. Printed by the authority and under the direction of the Bureau of Geology and Mines, Jefferson City, 1874.

THIS volume, comprising 734 octavo pages, besides index and plates, is a worthy successor to the report of Prof. PUMPELLY. Like that report, it treats with special fullness of the resources of Missouri in useful minerals, and cannot fail of a direct and immediate effect in advancing the development of the State. We take pleasure in presenting to our readers as full an account of its contents as our limited space will permit.

Besides the chief geologist, the principal contributors to the report are Dr. ADOLF SCHMIDT, Messrs. CHARLES J. NORWOOD, J. R. GAGE, and P. N. MOORE, assistants, and Mr. REGIS CHAUVENET, the chemist of the survey. The report proper contains thirty-five chapters, of which there are six, by Mr. BROADHEAD, devoted to general features of the topography, geology, and productions of the State; fifteen, by Messrs. BROADHEAD and NORWOOD, to the special description of various counties; seven, by Dr. SCHMIDT, to the lead region of Southwest Missouri, including numerous descriptions of local ore deposits; four, by the same author, to the lead region of Central Missouri, and one, by Mr. GAGE, to the lead region of Southeast Missouri; one, by Mr. MOORE, to the iron ores of Southeast Missouri, and one, by Dr. SCHMIDT, containing practical rules of developing iron ore deposits, together with a valuable summary of the metallurgical character of the Missouri iron ores, to which we have already made editorial reference. There are also five appendixes, containing, respectively, notes on the history of lead mining in Missouri, by Mr. HENRY COBB; a description of the lead mines of Upper Louisiana (the province formerly comprising this territory), extracted from American State papers; and tables of metallic statistics, lists of mineral springs, and the results of Mr. CHAUVENET's numerous analyses.

The plates appended to the volume comprise about ninety lithographic illustrations, referring, almost without exception, to ore deposits and mining and metallurgical operations. We shall refer to this excellent Report more at length on another occasion.

We have received the following books, notices of which we must postpone to another number:

Annual Report of the Director of the Mint, for 1874.
Mineral Statistics of Great Britain for 1874.
Dr. C. de Neve Foster's Report on the Metalliferous Mines of Cornwall, etc.
Mr. Harriss Gastrell's Report on the Iron and Steel Industries of the United States.
Nordhoff's Politics for Young Americans.
Wellington's Diagram Computations of Railway Earthwork.

Chrome Iron.

ONE thing is demonstrated beyond question, that there are immense deposits of chrome iron in Sonoma County. It is now being shipped East, and we are informed nets only $1.50 a ton. At the manufactory it is worth from $40 to $60 a ton. Here is a margin for profit. Chromium is extracted frome iron stone, named from its tendency to impart useful and beautiful colors. Chromium compounds are used in photography, in printing and in dyeing. The brilliant green color used on legal tender notes is a chromic oxide. The same pigment is used in staining glass and painting porcelain. The base of all its combinations is the common yellow chrome of commerce. One of its combinations, a chromic chloride, is said to possess virtue as a remedy for cancer. Witter springs in Lake County may owe its peculiar virtue in cancer to this ingredient in its waters, as it is surrounded by deposits of chrome iron.

Chromium steel is made by combining five per cent. of chromium with cast iron. On account of its excessive hardness it is used in the construction of safes. It has also great tensile strength and is extensively used in the construction of suspension bridges.

We have vast deposits of this valuable metal in Sonoma, and the day must come when it will be utilized and made a source of profit and revenue. In the United States the only chrome iron mines worked are in Maryland, near Baltimore.—*Sonoma Democrat.*

Coke Ovens at Blast Furnaces.

THE most important advantage connected with making coke at the furnace lies in the ability to produce a pure material, of reliable and uniform quality. The blast-furnaces will then be in a position to protect themselves in case of a rise of coal. During the last rise the furnaces of the Siegen district were furnished with very dirty, impure, and imperfectly burned coke, though they were compelled to pay a much higher price than that due to the rise in coal. An additional advantage is enjoyed in always being able to work with better fuel than if the coke were bought. In general the furnaces will make as good a coke as they can, the coke merchant, on the contrary, as good a coke as he must. With good fuel, furnaces can produce better pig-iron, and this is of great weight to the Siegen district, where very pure ores are smelted with middling, if not actually with bad, coke.

I confess, however, that the following facts might, under certain circumstances, be regarded as offsetts to the above advantages. (1) The coke may be used immediately after being drawn, in which case it would be very wet outside while yet glowing inside. This can easily be prevented by allowing the coke to cool at least six hours before using it. (2) It is less difficult, when cars are scarce, to maintain a sufficient supply of coke than to maintain a supply of coal, for the former is scarcely liable to change, while the latter rapidly loses value on exposure and even becomes almost unfit for use in coking after lying five to six weeks. On the whole, however, the advantages of making coke at the furnace considerably outweigh the disadvantages, and on financial grounds the location of the coke ovens near the furnace is advisable.

In my opinion there is great and unqualified advantage in combining a coal-washery with every coke works. Coke made direct from coal out of the mine is very bad; that made out of screened coal is better, but yet far from being satisfactory. Further, it is scarcely possible to get ten tons of screened coal on a long car without losing a good deal by dropping off on the way. Even the advantage from the percentage of slate washed out of unscreened coal does not compensate this loss. The coke works at the Germania furnaces produced, on an average, 66 per cent. of coke out of screened coal, but after bringing the washery into operation on unscreened coal, they produced 70 per cent., notwithstanding the loss of weight caused by washing out the slate.

The washing apparatus used at the Germania works was erected by the Humboldt Company, and the process to which the coal is subjected in it is as follows: The coal is raised, in small iron cars, up to the top of the building. The cars are then emptied on to a screen with openings 2¾ inches square. The lump coal falls down over the screen and may be loaded direct into other cars. If this is not desired, it may be broken on the screen itself. The coal that passes through goes first into a pair of coarse rollers, set about 2 inches apart. Thence it is lifted by an endless belt into a rotary screen, that separates the lumps into four sizes, the smallest of which is ¼ of an inch in diameter. This size goes direct to the fine rollers, and is not washed. This can be done with most of the Westphalian coals, since the fine coal contains very little impurity of any kind. The next two sizes, respectively ½ inch and 1 inch in diameter, fall into the washing machine or jigger, while the coarsest lumps go back to the first set of rolls. The coal from the washing machine is dried, passed through a set of rolls set close together, and is then lifted on an endless belt into bins for the coke-oven charging cars.

In a coke works of any size it would be advisable to separate the fine coal before crushing in the rollers. Some coke burners prefer a disintegrator to the set of fine rolls, but not wisely, as there is little to recommend the former. The washer requires scarcely any attendance, and costs little for labor, since one hand can take charge of all the washing machines usually used.—*Exchange.*

The Cause of Earthquakes and Volcanoes.

IN the department of physical geology the most important addition to our knowledge has been made by Mr. ROBERT MALLET, F.R.S., in a paper on "Volcanic Energy," read before the Royal Society in 1872, and published in the last number of the *Philosophical Transactions*. In it he shows the various relations and points of connection between volcanic phenomena, earthquakes, and the lines of mountain elevation, which imply that they are the results of the play of one set of cosmical forces which have been brought into operation by the gradual cooling of the earth from an incandescent sun-like state to its present condition. His argument is as follows:—As the cooling of the earth proceeded the crust gradually thickened and contracted less and less as the temperature became lowered. The hotter nucleus, on the other hand contracted more, being at a higher temperature than the crust, and having a higher co-efficient of contraction for equal loss of heat. By this process, which is still going on, the crust of the earth would shrink at one rate, and the vastly hotter central portion at another and greater rate, and cavities would be formed between the crust and the nucleus,—cavities which would be inevitably filled by the *crushing down* of the solid crust on the more swiftly contracting nucleus, by the force of gravitation, which is sufficient to crush the hardest rocks, and as the solid crust follows the shrinking nucleus, "the force expended in mutual crushing and dislocation of its parts is *transformed* into *heat*," by which, at the points of crushing the rocks are heated even to fusion. The access of water to such points determines volcanic eruption. These points of crushing may occur at various depths in the solid crust. He then proceeds to measure the amount of actual contraction by the annual amount of heat, lost by radiation into space, which is sufficient to liquefy 777 cubic miles of ice into water at 32 degs., and comes to the conclusion that less than one-fourth of total annual loss of heat would suffice to produce the contraction necessary for his hypothesis. The actual amount of annual contraction is estimated at a reduction of 3-5 in., an amount too small to be measured by any astronomical method, and yet more than enough to produce all the volcanic phenomena now to be observed on the surface of the earth.

COMPARATIVE SHIPMENTS OF ANTHRACITE COAL TO TIDEWATER FOR THE YEARS 1873 AND 1874.

COMPILED FROM OFFICIAL REPORTS MADE BY EACH INTEREST.

Months.	Phil. and Reading RR. Co.				Delaware and Hudson Canal Co.				Lehigh Valley RR. Co.				Lehigh and Wilkes-Barre Coal Co.				Del. & Lackawanna & Western RR. Co.				Pennsylvania Coal Co.			
	1873.	1874.	Original Allotted Quota. 1874.	Amended Quota. 1874.	1873.	1874.	Original Allotted Quota. 1874.	Amended Quota. 1874.	1873.	1874.	Original Allotted Quota. 1874.	Amended Quota. 1874.	1873.	1874.	Original Allotted Quota. 1874.	Amended Quota. 1874.	1873.	1874.	Original Allotted Quota. 1874.	Amended Quota. 1874.	1873.	1874.	Original Allotted Quota. 1874.	Amended Quota. 1874.
February	14.157	16,494 00	25,000	25,000	7,632	13,096 12	15,000	15,000	96,310 08	70,000	130,000	70,000	79,013	48,133 04	50,000	50,000	114,345	80,707 19	80,000	80,000	59,612	40,000	40,000	40,000
March	24,441	117,490 10	155,000	155,000	25,424	49,311 15	30,000	30,000	131,615 16	130,000	180,000	130,000	108,137 12	108,137 12	125,000	125,000	143,457	118,031 07	130,000	130,000	50,186	50,000	50,000	50,000
April	166,343	226,243 10	250,000	212,500	74,580	137,847 11	75,000	75,000	171,838	145,045 10	180,000	153,000	109,678 11	159,674 11	150,000	127,500	147,561	144,031 17	160,000	136,000	83,494	85,000	85,000	72,250
May	295,552	326,456 10	350,000	280,000	97,829	233,847 11	150,000	120,000	188,866	161,597 17	200,000	170,000	219,196	166,352 08	200,000	170,000	146,022	139,209 19	160,000	136,000	123,151	120,000	120,000	102,000
June	391,683	440,456 10	375,000	375,000	253,858	353,858 06	225,000	225,000	173,684 04	144,000	180,000	160,000	158,086	179,745 00	200,000	160,000	145,003	129,686 17	160,000	128,000	116,702	110,799 11	120,000	96,000
July	446,600	391,633 10	350,000	280,000	403,330	295,000	225,000	225,000	181,034	139,146 01	180,000	130,810	130,810	135,433 13	175,000	175,000	116,348	80,084 06	130,000	130,000	114,254 11	120,000	120,000	120,000
August	325,530	172,838 10	175,000	175,000	196,781 07	125,000	125,000	125,000	200,691	115,093 09	180,000	120,404 06	109,198	129,404 06	200,000	150,000	125,561	75,537 19	140,000	70,000	101,972	110,000	110,000	55,000
September	325,530	190,728 00	350,000	262,500	184,491 11	250,000	250,000	250,000	194,718	114,030 11	180,000	120,000	163,324	166,859 05	200,000	150,000	124,444	109,115 06	140,000	140,000	118,366 09	125,000	125,000	125,000
October	276,340	340,746 00	330,000	247,500	161,643 09	217,000	162,750	150,000	155,549	165,444 01	178,000	133,500	198,251	167,004 08	200,000	150,000	123,583	114,632 00	140,000	105,000	105,831	85,150	115,000	86,250
November	257,967	131,605 05	350,000	250,000	130,638	149,411 02	150,000	150,000	120,359	127,458 01	130,000	130,000	123,376 13	115,000	115,000	115,000	102,791	106,278 10	140,000	140,000	89,151	98,370 08	100,000	100,000
Total	2,210,602	1,949,716 15	2,585,000	2,182,000	1,573,744	1,438,547 18	1,837,000	1,540,250	1,661,652	1,371,335 18	1,598,000	1,372,500	1,516,201	1,383,231 00	1,615,000	1,372,500	1,289,015	1,096,319 00	1,380,000	1,195,000	927,213	1,009,789 19	985,000	846,500

Originally Allotted Quotas for 1874..... 10,000,000 tons.
Amended Quotas as per resolutions of the Committee, 8,508,250 "

Receipts at Tidewater, 1873..... 9,178,427 00 tons.
" 1874..... 8,248,928 10 "

AGGREGATE SHIPMENTS OF ANTHRACITE COAL TO TIDEWATER BY THE MEMBERS OF THE COAL COMBINATION DURING THE SEASONS OF 1873 AND 1874.

Months.	1873.						1874.						Quota to November 30.	Percentage of each Co. to whole Quota.
	Companies.	Deficiency of Shipments compared with Quota.		Total.	Originally Allotted Quota.	Amended Quota.	Companies.	Percentage of each Company to whole Quota.		Total.	Originally Allotted Quota.	Amended Quota.		
		Tons.	Percentage of Deficiency.					Original.	Amended.					
February	Phila. & Reading R. R. Co.	361,397 07	20.85	36.13	2,585,000	2,182,000	Phila. & Reading R. R. Co.	25.85	25.64	92.91	2,585,000	2,182,000	1,949,716 15	25.83
March	Del. & Hud. Canal Co.	396,255 15	20.11	25.51	1,837,000	1,540,250	Del. & Hud. Canal Co.	18.37	18.10	93.39	1,837,000	1,540,250	1,438,547 18	18.36
April	Lehigh Valley R. R. Co.	53,348 00	3.11	3.43	1,598,000	1,372,500	Lehigh Valley R. R. Co.	15.98	16.13	99.95	1,598,000	1,372,500	1,371,335 18	15.98
May	Del. Lack. & West. R. R. Co.	213,799 01	12.26	13.77	1,615,000	1,372,500	Lehigh & Wilkes-B're C. & I. Co.	16.15	16.13	100.78	1,615,000	1,372,500	1,383,231 00	16.12
June	Pennsylvania Coal Co.	190,985 04	12.00	12.20	1,380,000	1,195,000	Del. Lack. & West. R. R. Co.	14.05	14.05	91.74	1,096,319 00	1,009,789 19	1,009,789 19	11.730.000
July		137,786 08	8.87	8.87	985,000	846,500	Pennsylvania Coal Co.	9.85	9.95	119.39	985,000	846,500	927,213 12	9.92
August					8,508,250	8,248,928 10		100.00	100.00	96.95	8,248,928 10	8,248,928 10	9,178,428 05	100.00
September														
October														
November														
Total		1,553,571 15	14.48	100.00				100.00	100.00	100.00			10,739,000	

Months.	Percentage to whole Quota.	Shipments to November 30.	Percentage of each Co. to its Amended Quota.	Percentage of each Co. to whole Shipments.	Original Allotted Quota. 1874.	Amended Quota. 1874.	Original Allotted Quota. 1874.	Amended Quota. 1874.	Original Allotted Quota. 1874.	Amended Quota. 1874.	Original Allotted Quota. 1874.	Amended Quota. 1874.	Shipments to November 30.	Percentage of Shipments of each Co. to its Amended Quota.	Percentage of each Co. to whole shipments.	Amount shipped less than Amended Quota.	Amount shipped over Amended Quota.	Percentage of Deficiency of each Co. to total Deficiency.
February	25.83	1,949,716 15	79.75	24.08	25,000	25,000	15,000	15,000	70,000	70,000	50,000	50,000	1,949,716 15	92.91	23.64	332,283 05		89.57
March	18.36	1,438,547 18	79.89	17.15	155,000	155,000	30,000	30,000	130,000	130,000	125,000	125,000	1,438,547 18	93.39	17.44	101,452 02		39.28
April	15.98	1,371,335 18	96.80	16.10	350,000	280,000	225,000	225,000	180,000	180,000	150,000	150,000	1,371,335 18	99.95	16.63	664 02		00.26
May	16.12	1,383,231 00	85.64	16.53	375,000	375,000	225,000	225,000	180,000	180,000	150,000	150,000	1,383,231 00	100.78	16.78		10,731 00	+04.13
July	13.79	1,185,014 16	87.64	14.04	350,000	280,000	225,000	225,000	180,000	180,000	150,000	150,000	1,096,319 00	91.74	13.29	98,681 00		38.05
August	9.92	927,213 12	87.06	10.10	330,000	247,500	150,000	150,000	130,000	130,000	115,000	115,000	1,009,789 19	119.39	12.22		163,287 19	+19.89
September					350,000	250,000	150,000	150,000	130,000	130,000	115,000	115,000	927,213 12	96.95	11.23	174,008 19		67.97
October					330,000	247,500	150,000	150,000	130,000	130,000	115,000	115,000	433,330 09	43.70	5.25	566,669 11		03.05
November					350,000	250,000	150,000	150,000	130,000	130,000	115,000	115,000						
Total	100.00	10,739,000	85.52	100.00	2,585,000	2,182,000	1,837,000	1,540,250	1,598,000	1,372,500	1,380,000	1,195,000	8,248,928 10	96.95	100.00	1,708,071 90	174,008 19	100.00

The Coppee Coke Oven.

In Belgium, and on the Continent generally, for some time past, there has been in use a system of coke ovens invented by Mr. COPPEE, and report has spoken so well of it, that English makers are gradually adopting the ovens, which possess many advantages over the old class of ovens now in use in this country. It will be remembered that at the meeting of the Iron and Steel Institute, which was held in Belgium last year, M. GILLON, a lecturer in the University of Liege, read a paper on the manufacture of coke in Belgium, in which he enumerated the various descriptions of ovens in use, and gave details as to the advantages and results particularly of the Smets oven and also of the Coppee furnaces. He spoke very favorably of the latter system. The number which has been erected on the Continent is a proof of its success. In Belgium there are 524 in use, in Prussia 1,305, in France 186, and in England only about 30. Among the firms in this country who are erecting these ovens are the Barrow Hematite Steel Company and the Ebbw Vale Company. The three chief advantages claimed by the inventor are (1) rapidity of operation ; (2, and the most important,) a largely increased yield ; and (3) an improved quality. It is proved by actual working that one Coppee oven will turn out, at least, as much as two ordinary Beehive ovens, and this is easily explained by the fact that all the coke is cooled outside, and the oven refilled in a few minutes. The coke, it must be mentioned, is coked in comparatively thin sheets between heated brick walls, and the ovens themselves are placed together in groups of two and two. It is scarcely possible to give an accurate description of the details of the oven without the aid of diagrams, but we may state that the chief characteristics are (1) a small width and an arrangement of channels specially suited for poor coals. (2). A combustion of gas by a double admission of air, which entirely suppresses the smoke. (3). The combination of all the hot gases in a large conduit beneath the ovens, and their utilization for heating boilers. (4). Galleries for cooling and preserving the brick work. It is claimed that a large surface of ground coal is, by this system, exposed to a very high temperature, which is nearly always maintained. The coal, being ground, is in the best condition for giving off its gases rapidly, and by the arrangement of the flues, and the plan of discharging alternately, the coal gases given off by the oven just filled mingle at once with those of the next oven, which, by this time, is giving off its gases at their highest temperature. The thin layer of ground coal burns on all sides at once, the volatile gases are rapidly expelled, and the oven is ready to be drawn in a third of the time required by the ordinary ovens. The yield is so much increased also, that at least ten tons of coke are saved in every 100 tons of coal burnt. This is accounted for thus :—In the old system the coal is thrown into a cooled oven. A vast quantity of heat is absorbed in raising the temperature of the oven sufficiently to coke the coal, the volatile gases escape directly into the atmosphere and do very little towards burning the coal, which in these ovens is chiefly effected by the combustion of a portion of the fixed carbon. The coal commences to burn at the top, it cokes gradually downwards, part being completely consumed away before the rest is ready. From these causes the loss in yield arises. Contrast this with the working of the Coppee oven. A thin layer of ground coal is introduced into an oven already in an incandescent state, the coal is attacked on every side at once, the volatile gases of neighboring ovens mingle and are consumed in flues all round, maintaining the uniformly high temperature. The whole contents of the oven are coked altogether before any of the fixed carbon has been burnt. Within two per cent. of the theoretical yield can be obtained in the shape of coke. With respect to the improvement in quality, the Coppee-made coke is both harder and denser than the ordinary coke, while some qualities of coal, which are not sufficiently bituminous to coke in the old ovens, will make a good coke when burnt in the Coppee oven. We have also the advantages of a slight saving of labor in the Coppee, and its adaptability for the utilization of the waste gases in the production of steam. From two to four horse-power per oven is usually produced by the waste gases. Mr. BAINBRIDGE, some time ago, read a paper before the Institute of Mining and Mechanical Engineers, at Newcastle, in which he compares the results of the Beehive and Coppee systems. The first cost of an oven producing two tons of coke per day is £100 in the Coppee and £119 7s. in the Beehive system, while the time burning is 24 hours and 48 to 120 hours respectively, and the time occupied in emptying and refilling 8 minutes and 60 minutes. The labor charges are 11d. and 15d. respectively. When 1,000 tons of coal per week are consumed, the saving per annum amounts, it is said, to nearly £5,000. We learn that the washed slack from the Silkstone or Parkgate seams would produce from 65 to 70 per cent. of hard coke suitable for use in the blast furnace, the cupola, and the Bessemer process.—*Mining Journal.*

COAL TRADE REVIEW.

Import Duty on Coal.

Anthracite free. *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c., gold.

Not otherwise provided for, per ton, 40c. gold.

This is the only report published that gives full and accurate returns of the production of our Anthracite mines.

NEW YORK, Dec. 24, 1874.

The Production of Anthracite Coal for the week ending Dec. 19, 1874, was as follows :

Tons of 2240 lb.	WEEK. Tons.	YEAR* Tons.
Wyoming Region.		
Delaware and Hudson Canal Co	51,481	2,326,278
Delaware, Lackawanna and Western R.R	39,707	2,442 239
Pennsylvania Coal Co	26,186	1,299.339
Lehigh Valley R.R.....	14,462	919,803
Pennsylvania and New York R.R	....	57,596
Central Railroad of New Jersey	36,124	1,486,020
Pennsylvania Canal	....	321,374
Sold at the mines by L. & W. C. Co.....	553	23,393
	168,513	8,876,042
Lehigh Region.		
Lehigh Valley R.R	58,567	3,118,441
Central Railroad of New Jersey.....	28,011	1,169,778
Danville, Hazleton & W. B.R.R., ...	451	40 010
	87,029	4,328,229
Schuylkill Region.		
Philadelphia and Reading R.R	86,609	5,258,319
Shamokin and Lykens Valley.....	5,842	890,669
	92,451	6,148,988
Sullivan Region.		
Sullivan and Erie R.R	577	33.384
Total of all the regions.....	348,570	19,386,643

* Year beginning Jan. 1.

The following table does not give the entire production of our bituminous mines, but it is by far the fullest report published.

The Production of Bituminous Coal for the week ending Dec. 19, was as follows :

Tons of 2000 lb., except where otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2240 lb.....	24,896	2,294,689
Barclay Region, Pa.		
Barclay R.R. tons of 2240 lb.....	6,535	299,981
Broad Top Region, Pa.		
Huntingdon & Broad Top R.R.....	4,420	220,296
Clearfield, Region, Pa		
Snow Shoe.....	1,455	59,811
Tyrone and Clearfield.....	14,460	615,681
Allegheny Region, Pa.		
Pennsylvania R.R.....	3,542	200,981
Pittsburgh Region, Pa.		
West Penn. R.R.....	1,865	187,572
Southwest Penn. R.R.....	26	7 447
Penn. and Westmoreland gas coal, Pa. R.R.	19,055	870,519
Pennsylvania R.R.....	5,832	432,257
Kanawha Region, W. Va. to Dec. 12.		
Chesapeake and Ohio R.R	3,418	131,892
Shipments from *Block House Region, N. S.*, to Dec. 11.		
Consigned to the Provinces, tons 2240 lb...	713	15.028
" " " United States " " "...	....	15,486
" " Cuba " " "...	520	1,611

The Production of Coke for the week ending Dec. 12.

Tons of 2000 lb.

	Tons.	Year. Tons.
Tyrone and Clearfield.....	38	796
Alleghany Region.....	....	118
West Penn. R.R., " " " " "...	1,466	43.502
Southwest Penn. R.R " " " " "...	8,894	409,243
Gas Coal, Penn. R.R. " " " " "...	950	39,410
Pittsburgh Coal, Penn. R.R. " " " "...	1,572	64,609

Production of Bituminous Coal. 1874.

Tons of 2000 lb.	10 mos.	Nov.	11 mos.
Blossburgh Region.....	717,418	52,336	769.754
Barclay Region.....	410,300	42,241	452,541
Broad-Top Region.....	190,466	18,134	208,600
Cumberland Region.....	2,268,010	203,662	2,471,672
Clearfield Region.....	596,911	46,814	643,725
Alleghany Region.....	180,445	12,370	192,815
Pittsburgh Region.			
West Penn. RR.....	171,230	12,058	183,288
Southwest Penn. RR.....	6,933	388	7,321
Gas Coal, Penn. RR.....	770,794	61,023	831,817
Pittsburgh Coal, Penn. RR.....	400,139	19,087	419,226
Saw Mill Run RR.....	71,667	7,889	79.536
Cleveland and Pittsburgh RR..	250,856	22,349	273,205
Pittsburgh, Cincinnati and St. Louis Rit.....	496,414	57,408	553,902
Erie and Pittsburgh RR.....	243,197	17,755	260,972
Pittsburgh, Fort Wayne and Chicago RR.....	170,772	11,638	182,410
Castle Shannon RR.....	92,799	12,882	105,661
A. Y. & P. R.R.....	293	614	907
Pittsburgh and Connellsville RR	296,105	..	..
Monongahela Nav. Co.....	1,848,656	..	..
Keeling & Co	147,546	7,907	155.453
Wettengal & Gormley.....	11,877	1,463	13,340
J. W. Carlin & Co.....	3,817	..	..
St. Louis Region.			
Tenn. Coal & R.R. Co.....	62,778	9,818	72,596
St. L. A. & T. H. R. R. Belleville Branch.....	112,799	..	..
B. & S. I. R.R.....	63,940	..	..
Illinois and St. Louis.....	154,770	16,202	170,972
Indiana North and South RR...	5,851	..	..
Evansville & Crawfordsville RR	13,155	..	..
Ohio & Mississippi RR.....	105,314	..	..
Kanawha Region.			
Chesapeake and Ohio RR.....	116,912	10,665	127,577
Warrior Region, Ala.			
South and North Alabama RR..	23,365	..	..
Cahaba Region, Ala.			
South and North Alabama Rit..	3,085	..	..
S. R. & D. R.R.....	12,221	1,118	13,339
Chicago R. & Q. R.R	249,178	32,773	281,951
B. & M. R.; R.R.....	60,752	7,724	68,476
Union Pacific R.R. Co.'s mines..	131,327	..	..
" " " other mines..	81,174	..	..
Summit County R.R.....	17,412	..	..
Keokuk & Des Moines R. R.....	..	3,876	..
	10,560,678		

The production of Anthracite for the week ending Dec. 19th was as follows : Wyoming Region, 168,513 tons, being 12,541 tons less than the preceding week. In the Lehigh region, 87,029 tons, or 4,828 tons more than the week before, and in the Schuylkill region, 92,451 tons, being 806 tons more than the preceding week.

The total production of Anthracite from all the regions was for the week 348,570 tons, as against 355,322 tons the preceding week, or a decrease of 6,752 tons. From January 1st to Dec. 19th, there were produced 19.386,643 tons, as against 18,897,589 tons for the same period last year. The figures of last year's production are taken from the Pottsville *Miners' Journal.*

The receipts at Port Richmond were 18,000 tons ; shipments, 14 600 tons ; and balance on hand 135,200 tons.

Returns from Greenwich, Philadelphia.

	Bituminous.	Gas Coals.
Receipts.....	3,676	522
Shipments	3.339	974
On hand.....	2,408	308

The receipts of coal by the Michigan Southern RR. at Buffalo for the week were 7,359 tons.

The exports of coal from Baltimore this year amount to 69,079 tons, as compared with 66,256 tons in 1873. The exports for the week amounted to 2,260 tons.

The production of Cumberland coal from January 1 to Dec. 19, inclusive, was 2,294,689 tons of 2240 lb., against 2,516,854 tons to the corresponding date in 1873. The production for the week was 24,896 tons, as compared with 3,677 tons for the corresponding week in 1873. This is a total increase for the week of 21,219 tons as compared with 1873, and a decrease for the year, thus far, of 222,165 gross tons.

The quantity of Anthracite Coal being marketed is about the same, with no change in prices. Domestic sizes are in fair request, while other descriptions are quite dull.

Freights are more firm, although vessels are abundant—especially the larger ones. The owners do not care to make trips during the cold weather with little or no profit.

In Foreign Coals there is nothing new. The price at which the cargo of *Newcastle*, reported in our last was sold, is still kept private. The cargo of *Silkstone*, which has been on this market for some time, is still unsold.

The following is a report of shipments from the Pictou mines to the closing of the port :

Mines.	Destinations. United States.	West Indies.	South America.	Canada.	Other Provinces.	Total.
Nova Scotia.	13,915	2,920	1,890	10,702	16,747	46,174
Vale	2,124	6,854	1,112	11,863	12,341	34,294
Inter Colonial	9,815	1,530	.....	28,012	9,966	49,323
Acadia.....	3,016	6,695	.....	17,434	30,950	58,095
Albion.....	22,819	1,605	330	43,003	17,660	85,417
	51 689	19,604	3,332	111,014	87,644	273,303

The following is an extract from a private letter bearing date of Sydney, C. B., Dec. 12 :—"I am happy to inform you that the Louisburg Railroad is fast approaching completion, and I do not hesitate to say that the line will be ready for traffic by the first of April. More than half of it is now in working order. I went to the iron bridge at Mira, which is half way, last week, on the locomotive. This bridge will be finished this week, and it is certainly a splendid piece of work. I am well aware that parties are saying and doing all they can against the

Louisburg project; but it is of little use, as they cannot hinder the work from going ahead. They may say what they please with respect to this port, and the facilities to be desired from it; I question if any of the mines will stand much chance while we can supply coal at Sydney and Louisburg."

The Cumberland Coal Trade is very quiet. We note the sales of 1,000 tons for shipment to Cuba, and 1,500 tons to San Francisco, both on private terms. Purchases are being made now for the San Francisco spring trade, and they make quite an item for these depressed times. There is from 35,000 to 40,000 tons of coal in stock at Georgetown and Alexandria, and but very little at Baltimore. There is some talk of an adjustment of wages to be made in this district for next year. Freights are higher—$1 85 having been paid from Baltimore to Boston.

The meeting of the Lehigh operators, which was to have been held at the Mansion House, Mauch Chunk, on the 22nd inst., has been postponed until the 30th, and the meeting of the members of the general coal committee, which was to have taken place in this city on the 23d inst., has been postponed until the 29th. The Wyoming operators met on the 22nd inst., but we have been unable to learn what they did.

In another part of this issue will be found the notice of the 133d auction sale of the Delaware, Lackawanna and Western R.R Co. The amount to be sold will be 30,000 tons, as compared with 50,000 tons last month.

Wholesale Prices of Anthracite Coal for Dec. f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
†Lackawanna and Scranton at Elizabethport & Hoboken	5 55	5 65	5 75	5 90	6 40	5 35
*Pittston at Weehawken	4 75	4 75	4 85	4 95	5 35	4 50
*Wilkesbarre at Port Johnston	5 55	5 65	5 75	5 90	6 40	5 35
Plymouth, R. A	....	....	5 75	5 90	6 50	5 35
Susque. Coal Co.at Amboy W.A.	5 55	5 65	5 75	5 90	6 50	5 35
Kingston at Hoboken	5 55	5 65	5 75	5 90	6 40	5 35
***Lehigh Coals.**						
Old Company at Port Johnston	6 50	....	6 45	6 45	6 60	5 65
Old Company's Room Run "	6 00	....	6 00	6 00	6 35	5 35
Sugar Loaf at "	6 00	....	6 45	6 45	6 60	5 65
Lehigh Coal Exchange "	6 35	....	6 30	6 30	6 45	5 50
Honey Brook at Elizabethport	6 35	....	6 30	6 30	6 45	5 50
Spring Mt. C. Co. at Hoboken	6 35	....	6 30	6 30	6 45	5 50
Beaver Meadow at South Amboy	6 35	....	6 30	6 30	6 45	5 50
Schuylkill Coals at Port Richmond.						
Schuylkill white ash	5 05	5 15	5 25	5 40	5 90	4 45
Schuylkill red ash	....	....	5 40	5 50	5 95	4 55
Shamokin white and red ash	....	....	....	5 40	5 90	4 45
N. Franklin	....	....	5 85	5 85	5 90	4 45
Lorberry	....	....	6 20	6 20	6 20	4 80
Lykens Valley	....	....	....	6 85	6 85	5 40

* Small or Pea coal is quoted by these Companies at $1 35 per ton less than Chestnut.

† f.o. b. in New York Harbor.

Pittston coal is delivered to carts in New York or Brooklyn at an additional charge of 40 cents per ton to the above quotations

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to New York	40c.
" " South Amboy to New York	45c.
" " Port Richmond, "Phila." to N. Y. alongside	950.
" " Rondout to New York by boat or barges of the D. & H. Canal Co. "delivered"	50 c.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb. Shipping Ports.	At the	Alongside in New York.
Westmoreland and Penn, at Greenwich, Philadelphia	$6 25	$7 65
" " at S. Amboy	7 00	..
Red Bank Cannel Co., at Phil	8 50	8 50
" " at S. Amboy	8 00	....
" Orrel, "	7 00	7 65
" " at Philadelphia	6 25	....
Youghiogheny, Waverly Co, at Baltimore	6 00	7 65
Despard, West Va., "	5 60	7 40
Murphy Run, W. Va. at Baltimore	5 60	7 40
Fairmount, W. Va "	5 60	7 40
Newburgh Orrel, Md. "	5 50	7 40
Cannelton Cannel, W. Va., at Richmond.	11 00	12 50
" Splint, " "	5 25	7 50
Peytona Cannel, " "	....	12 50
Sterling " Ohio	....	12 00
Straitsville, " At Sandusky, O	3 65	11 50

Foreign Gas Coals.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	12/@13/6	7 00@ 8 00
Liverpool House Orrel, at Liverpool	29/	13 00
Ince Hall Cannel "	52/	18 00
" Gas Cannel "	40/	15 00
Scotch Gas Cannel, at Glasgow, nominal.	28/	9 50
	Gold.	
Block House, at Cow Bay, N.S.	2 25	6 30
Caledonia, at Port Caledonia	1 87½	5 7c
Glace Bay, at Glace Bay	2 00	5 5c
Lingan, at Lingan Bay	2 25	6 30
Sydney, International and Reserve mines, at Sydney	2 25	5 75
Pictou, Albion and Vale mines, at Pictou	2 50	6 50

Steam and House Coals.

Broad Top, at the mine, $1 25; at Port Richmond, Phil	4 75@5 00	6 00@6 25
Cumberland, at Georgetown and Alexandria, Va	4 30@4 40	5 75@6 00
Cumberland at Baltimore*	4 60@4 75	[6 25@6 50
Clearfield, "Derby," "Kitanning" and "Sterling," at the mines, $1 25; at Greenwich, Phil	4 75@5 00	6 25
James River, carbonite, at Richmond, Va	6 75	9 00
" bituminous, "	4 00	6 25
*Schooner freights from Baltimore to New York are		$1 25
Barge " " " "		1 70

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$6 00	$6 20	$5 40
Lackawanna Coal delivered	7 60	7 85	7 10
Wilkes-Barre, delivered	7 60	7 85	7 10
Lehigh & Locust Mountain, del'd	8 00	8 00	7 50
Schuylkill Red Ash del'd	8 25		

The cost of delivering Pittston coal ranges from 40 cents to $1 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$23 00
Liverpool House Cannel " " "	25 00
American Cannel " " "	16 00
American Orrel " " "	16 00
Straitsville Cannel " " "	16 00
Carbonite " " "	12 00
Cumberland " " "	9 00

Coal Trade of Philadelphia.

PHILADELPHIA, Dec. 23, 1874.

The greater activity lately noticed in the trade is caused by the desire of dealers and consumers to accumulate a stock before a reduction of wages takes place, which, it is supposed, will bring a strike. The reduction is now agreed upon, and will range from 10 per cent. to 20 per cent., according to the work done; but it does not follow that it should bring a strike, considering the condition of every branch of industry and the necessity for a reduction, which the workmen in the coal region are better able to bear than almost any other class of workmen, as they are now better paid. The amount taken off the wages is reasonable enough, and if wise counsel prevails, and the leaders are posted, as they should be, there is no reason for a strike. By stopping, the workingmen will only play into the hands of the combined companies, and will eventually have to submit to the very reasonable concessions asked of them. It is to be hoped that it will be followed by a corresponding decline in the price of coal at the mines and the charges for transportation. All the rates are too high and no improvement can be expected in the demand for coal until some encouragement is given to the large consumers and a guarantee that it will be permanent. There is enough coal of the small sizes stored at points within reach of tidewater to supply the wants for domestic consumption until spring, and the trade needs something more than the domestic trade to be restored to a healthy condition. While a strike would temporarily assist the combination by enabling them to get rid more easily of their accumulated stock, it would also add to the consumption of bituminous coal. Very few vessels are taken up now, and at rates varying from $1 60 to $1 75 to Boston, and $1 30 to Providence.

Bituminous Coal, Wholesale.

Penn. and Westmoreland (Gas), f.o.b., Greenwich	6 25
Broad Top, (according to destination) f.o.b., Port Richmond	4 75@5 00
Clearfield f.o.b. at Greenwich, according to destination	4 75@5 00

Bituminous, Retail.

60 in yard, per 2240 lb., cartage added.

Anthracite, Retail.

Egg, per 2240 lb., $6 20; Stove, $6 25; Chestnut, $5 10; delivery coats, 75 cents extra.

Baltimore, Md. Dec. 23, 1874.

Reported by our Special Correspondent.

WHOLESALE PRICES PER 2240 lb.

ANTHRACITE.

	By cargoes.	In cars.
Wilkes-Barre, "Lee," or "Diamond,"		
Lump, steamboat	$5 15	$5 60
Broken	5 50	5 75
Egg	5 87	6 15
Stove	6 07	6 35
Pittston and Plymouth.		
Lump and steamboat	....	5 50
Broken	....	5 70
Egg	....	6 05
Stove	....	6 25
"Boston," freeburning white ash	....	5 50
Egg	5 87	5 7c
Stove	6 07	6 05
Shamokin, (red or white ash)	....	6 25
Egg	5 82	6 05
Stove	5 92	6 15
Lykens Valley, red ash, egg and stove	6 02	6 55

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2,240 lb, $7@8 25.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 60	4 75
West Va. Gas Coal f. o. b. at Locust Point	5 50	....
Kanawha Cannel, coarse	13 oc	....
Tyrone	7 25	....
Ritchie Mineral of West Virginia	1 00	....

Boston. Dec. 23, 1874.

Reported by our special correspondent.

CARGO PRICES TO TRADE.

Lingan coal	$ 5 75	Westmoreland, and Penn.	7 75
Caledonia	5 00	Waverly Co. Youghiogh'y	7 75
Pictou	6 15	Cannelton Cannel	13 50
Block House	5 60	Cumberland	5 70@ 6 10
Red Bank Cannel	10 00	Anthracite,	6 50@ 7 25
Glace Bay	5 00	" Retail	7 50@ 8 00
Sydney	7 00		

Buffalo, N. Y. Dec. 23, 1874.

Per ton of 2000 lb.

	Slack.	Nut & Slack.	Nut.	Lump
Connelsville coke				6 50
Sterling cannel				6 00
Red Bank				5 75
Youghiogheny coal for gas				5 50
Briar Hill coal		3 25		5 00
Fairmount "		3 25	3 75	4 25
Catfish "		3 25	3 75	4 25
Stoneboro "	2 75		3 75	

Briar Hill coal, and Stirling and Red Bank cannels retail at $7 50; all other coals $1 per ton above wholesale prices.

Anthracite f. o. b. vessel.

Grate	6 70	Stove	7 15
Egg	6 70	Chestnut	6 65

Retail prices delivered and screened, $1 per ton additional

Chicago, Ill. Dec. 22, 1874.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

No change in prices of coal.

Retail prices per ton of 2000 lb. delivered to buyer.

		BITUMINOUS.	
Lehigh Lump	$10 75	Briar Hill and Erie	7 50@ ....
Lehigh prepared and car load lots	10 25	Walnut Hill (W. Va.)	6 50@ ....
Lackawanna, Wilkes-Barre and Pittston,*		Midway (West Va.)	6 50@ ....
Grate, egg, and chestnut.	9 50	Cannel	8 00@ 9 00
Stove or range	10 00	Blossburg	8 00
		Indiana Block	6 00
		Hocking "Brooks"	6 00
		Wilmington and Illinois	5 00

*75 cents off these prices for car load lots to country dealers and manufacturers.

Cleveland, O. Dec. 23, 1874.

Reported by our Special Correspondent.

Per ton of 2000 lb. on cars.

Youghiogheny, l'p	$4 40	Columbiana	$3 00
Youghiogheny, nut	3 40	Strip Vein	3 20
Briar Hill, according to quality	$3 85 to 4 00	Mountain Blossburg (blacksmith)	5 50
Massillon	3 65	American Cannel Coal Co.s Cannel	4 50
Hocking Valley	3 25		
Straitsville	3 25		
Anthracite, Lackawanna on cars, Egg			$6 85
" " " " Stove			7 50
" " " " Chestnut			7 00
Youghiogheny Coke, " " here			5 25
Connellsville " " " "			5 50

50 to 75 cents per ton additional for delivery at retail.

Cincinnati, O. Dec. 23, 1874.

The price of coal has undergone no material change since last report. At present there is a prospect of another large run of coal from Pittsburgh, which will serve to still further depress the market here, already dull enough.

Per ton of 2000 lb.

	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	10 c.	—
Pomeroy coal	7@8 c.	
Cannel coal	18c.	—
Semi Cannel	11 c.	—

The following are retail prices delivered:

Youghiogheny	13 c.
Pomeroy	11 c.
Cannel	24 c.
Kanawha Semi Cannel	15c.
Anthracite	$9 00@10 00
Foundry coke	10c.
Soft coke	8c.

Detroit, Mich. Dec. 23, 1874.

Specially reported by Messrs. ROBINSON & KEYS, dealers in all kinds of coal.

Trade still dull. No change in prices, which please continue.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep.sizes.	10 00	Briar Hill	7 5c
Wilkes-Barre, Grate and		Willow Bank	7 00
Egg	9 00	Erie	7 50
Wilkes-Barre, Stove and		Massillon	7 00
Nut	9 50		

Erie, Pa. Dec. 23, 1874.

Reported by our Special Correspondent.

Wholesale, per ton of 2,000 lb.

Bituminous f.o.b.

Briar Hill lump	$4 00	Beaver lump	$4 00

Indianapolis, Ind. Dec. 21, 1874.

Specially reported by Messrs. H. MCCOY & Co.

Business dull. Little demand for coal in consequence of mild weather. Block Coal, on account of slight demand, and Youghiogheny Coal, on account of rise in Ohio river, have both declined in price. This winter is disastrous to both miner and dealer. We quote at wholesale and retail:

Per ton of 2000 lb.

BITUMINOUS.

Wholesale on board cars in city.

Block coal	$2 50@$2 75	Indiana cannel	6 75
Best "	2 40@ 2 50	Hocking Valley	4 25
Block Nut, per car	1 8 00	Youghiogheny	5 00
Highland " "	18 00	Blossburg (smithing)	6 50
Block slack, per car load.	....	Piedmont "	7 75
Peytons, cannel per ton	8 75	Gas coke, ... per bushel.	8c

ANTHRACITE (Lackawanna).

Grate	$8 70	Chestnut	8 60
Egg	8 70	Stove	8 85

Retail, per bushel of 70 lb.

Block	16c.	Peytona Cannel	32c.
Highland	14	Indiana "	26
Highland Nut, dom. use	9	Youghiogheny	24
Block " "	9	Blossburg	26
Slack, steam. " "	8	Piedmont	30
Block & Highl'd Mt. steam—			

ANTHRACITE.

	per ton.		per ton.
Grate	$11 00	Stove	$11 00
Egg	11 00	Chestnut	11 00

Louisville, Ky. Dec. 22, 1874.

Specially reported by Messrs. BYRNE & SPEED.

Our retail rates are as follows:

Pittsburgh, per load of 1900 lb	$3 50
Pomeroy	....
Buckeye Cannel	5 00
Peytona Cannel	5 75
Nut and Slack	2 50
Kentucky lump, per load	....
" nut, "	....
" Slack "	....
City-made Coke, per bushel	10c
Kentucky on cars at wholesale, per bush.	9c
Anthracite, per ton	$10 to $10 50

Milwaukee, Wis. Dec. 20, 1874.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail prices per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 50
Lehigh Prepared	10 50	Blossburg	8 00
Lackawanna	9 50	Pittsburgh	7 50

New Orleans, La. Dec. 19, 1874.

Good supply and but very little demand. We have, the mildest winter imaginable, even for this section, and this, with the hard times, plays havoc with the business.

Pittsburgh coal, retail, per bbl	75c
" wholesale	40c.
" to steamboats, per box	60c.
" to manufacturers, per bbl	65c.
" shipments per hhd	$7 00
Anthracite, retail, per ton	$12 50
" wholesale per ton	$9 00
Spadra (Arkansas) coal, retail, per bbl	75c.
Mt. Carbon, wholesale, per bbl	45c.
" " retail per bbl	65c.
Virginia Cannel, per bbl	90c.
Scotch Cannel, per bbl	1 00

Pittsburgh, Pa. Dec. 21, 1874.

Reported by our Special Correspondent.

Per ton of 2000 lb. and Bushel of 76 lb.

	per ton.		per ton
Youghiogheny coal	$2 00	Pittsburgh retail delivered per bushel	9c@10c
" coke	2 50		
Connellsville coal	2 10	Anth'cite on cars Lehigh	$7 75
" coke	2 75	" " Wilkes-	
Pittsburgh coal	1 85	Barre	6 75

Twenty-five to fifty cents per ton additional for delivery.

St. Louis, Mo. Dec. 21, 1874.

Specially Reported by the COLLINSVILLE COAL AND MINING COMPANY.

ANTHRACITE.

Per ton of 2000 lb.

	City delivery.
Lehigh Lump	$13 50
Lackawanna and Wilkesbarre	12 50
Semi Anthracite	9 50

BITUMINOUS.

Per ton of 2000 lb.

	E. St. Louis.	City delivery
Washington Indiana—smithing	$4 00	$4 87
O'Fallon, Ills	2 00	3 00
Collinsville and Belleville, Ills	1 75	2 75
Indiana Cannel	6 00	7 00
Missouri Cannel		5 00

Retail, 25c. per ton additional.

Imports from January 1st to December 1:

Anthracite, tons	11,843	Vancouver Island, tons	46,805
Australian, tons	126,068	Bellingham Bay, tons	13,185
Coos Bay, tons	43,725	Rocky Mountain, tons	343
Cumberland, tons	15,033	Seattle, tons	4,535
English, tons	25,301	Mt. Diablo (10 mos.)	168,182

San Francisco.

From the *Commercial Herald* of December 11.

The market is strong for all descriptions, although the free and increased coast supplies have a tendency to check any considerable rise in value. Imports for the week embrace the following: *Florida* from Cardiff, 1,488 tons; *Aurora*, 1,200 tons Seattle; *Sumner R. Mead* from Baltimore with 1,230 tons Cumberland in bulk, and 547 hhds same; *Two Brothers*, 1,368 tons from Liverpool. In addition to the foregoing we are in daily receipt of Black Diamond and other Mt. Diablo mines; also, Coos Bay, Bellingham Bay, and Nanaimo, by regular collier packets. The house demand draws heavy upon these latter descriptions of Bituminous; Wellington, Seattle, Coos Bay, etc. We quote Australian spot cargoes at $11@11 25; Cumberland, $15@18; Wellington screened, $11@11 50; Nanaimo, same; Bellingham Bay, $8 50, and Mt. Diablo, Black Diamond Coals, find sale at $8 25@9 25 per ton for coarse and fine. The *Cultivator* from Cardiff adds 1,720 tons to our stock.

Toledo, Ohio. Dec. 21, 1874.

Specially reported by Messrs. GOSLINE & BARBOUR.

Per ton of 2000 lb,

	Retail.		Retail.
Wilkes-Barre and Scranton, Large and Small Egg,	$8 35	BITUMINOUS. Blossb'g and Cumberl'd,	$8 00
Stove	8 50	Massillon Lump	6 00
Chestnut	8 35	Briar Hill	7 00
Lehigh Lump	10 00	Straitsville	3 75
		Hocking Valley	4 00

Soft coal screened retails from $4 00 to $6 00, according to quality.

Montreal. Dec. 23, 1874.

Reported by our Special Correspondent.

Per ton of 2,240 lb.

Scotch Steam	$4 50@4 75	Cape Breton Steam	$4 00
Picton "	4 25	Newcastle Smiths	5 50

Anthracite at retail, 2,000 lb., delivered, less 5 per cent.

Egg	$8 00	Nut	$8 00
Stove	8 50	Chestnut	7 75

Halifax, N. S. Dec. 21, 1874.

Reported by our Special Correspondent.

We have nothing to add to our advices of last week; prices of coal here continue about the same.

Prices per ton of 2240 lb. in gold.

Sydney (old mines)	$4 50	Little Glace Bay	3 50
Gowrie	3 50	Blockhouse	4 00
Victoria	3 50	Albion (at Railroad)	4 25

Toronto, Ont. Dec. 21, 1874.

Reported by our Special Correspondent.

ANTHRACITE.

	per ton.		per ton.
Broken	$7 65	Chestnut	$7 65
Egg	7 65	Lehigh	9 00
Stove	8 15		

BITUMINOUS.

Blossburgh	7 50	Screenings	5 00
Briar Hill	7 00	Soft Nut	5 50

Freights.

We note a firmer feeling in the rates of freights from Baltimore and Georgetown, and accordingly quote from these points to New York $1 50, and to Boston, $1 85, and Bath, Me., $1 80. The nominal rate from Elizabethport, etc., to Boston is nominally $1 30, and to Providence 90c. with vessels in full supply. Rates from Philadelphia are unchanged. We quote nominally $1 40 to $1 50 to Boston.

REVIEW OF THE BRITISH COAL AND IRON TRADES.

Compiled from our exchanges bearing date to December 5, 1874.

The Iron trade of the *North of England* is getting more settled. There is a manifest tendency for the prices of foundry iron to approximate nearer to those of forge, as they are now unduly high in proportion. Consumers are not pressing for purchases so strongly as they were. Quotations are f.o.b. Tees: No. 1 Pig, 69/; No. 2, 66/6d.; and No. 3, 64/, with merchants asking 62/3d.@62/6d. for the latter. Rails are quoted at £7 10/@£7 15/. Best cokes are quoted at 15/@15/6.

In the *Barrow-in-Furness* district, trade is in an unsatisfactory condition, with an inclination to lower prices. Quotations are; No. 1 Bessemer, £4 15/; No. 2, £4 12/6d.; No. 3, £4 10/.

At *Sheffield* there is much dullness in the manufacture of steel rails. The Atlas Works have given notice that the blooms for rails will not be put under the steam hammers before being put through the mills, so that a considerable number of men are under notice to leave, and others of a reduction of wages.

In the *Lancashire* district the demand for coal continues very brisk, but prices are again becoming settled. Coke is easier, and concessions are being made to large consumers.

At *Wolverhampton* there is a steady demand for the better class of finished iron. The prices of marked bars are steadily sustained at £10 10/@£11.

In *Monmouthshire* and South Wales, notices have been given of the termination of labor contracts at the end of this month, with both the colliers and iron workers. The iron trade continues about the same as heretofore reported, with only small orders for rails being received, and those not in great abundance. The coal trade is not so active, although, with the prospect of labor troubles, more business and firmer prices may be anticipated.

In *Scotland* the prices of pig iron are without material change. Prices of Warrants have been 84/@85/3d., the latter being the closing price. The quantity of pig iron in CONNAL'S stores on Monday, Nov. 30th, was 24,066 tons, or an increase of 1831 tons during the week. The principal makers' brands have, as will be seen by the following quotations, been considerably reduced in price: Gartsherrie, No. 1, 97/6d.; No. 3, 85/; Coltness, 100/ and 84/; Summerlee, 95/ and 81/; Langloan, 100/ and 83/; Gowan, 90/ and 81/; Calder, 183/; Shotts, 184/; Carnbroe, 92/ and 81/; Monkland, 88/ and 81/; Clyde, 88/ and 84/; Glengarnock, 94/ and 84/; Eglinton, 87/ and 79/; Dalmellington, 87/ and 80/; Kinneil, 90/ and 78/.

IRON MARKET REVIEW.

New York.

Dec. 24, 1874.

American Pig.—There are rumors of sales amounting to several thousand tons of Nos. 1 and 2 foundry irons, at prices equivalent to $22 75@$24 for No. 1, and $22 for No. 2, delivered at Hoboken. We are unable to authenticate these rumors, and suppose that, if the sales actually took place, they must have been made direct from the furnaces. We note a sale of 100 tons No. 2 X at $23. It is said that 1,000 tons No. 1 foundry iron, of a good Lehigh brand, was offered to a dealer in this city at $23, delivered at Hoboken, and was not accepted. We are informed that some of the furnace companies have been securing loans on their stocks of iron, for the purpose of carrying them over to a revival of trade. Others are trying to do so. The basis of the advances is said to range from $15 to $20 per ton. The market is very depressed and the demand is only for most pressing necessities. The only thing that can give life to the iron trade is the revival in the railroad interests, which, at the present time, are looking as bad as they did six months ago. It is only to the very best roads that a careful business man would sell, unless it be for cash, as the majority of roads are so covered with bonds as not to make the floating debt of the least value. It is impossible to predict the future of the trade, but good days, at the best, seem many months off. The usual quotations are: No. 1 X, $25 No. 2 X, $23; and Gray Forge $20@$22.

Scotch Pig.—The arrivals have been about 300 tons, most of which was sold ahead. The stock is very small, but sufficiently large for the requirements. Coltness is quoted at $40@$41; Glengarnock, $37@38; Eglinton, $36, but to arrive these figures can be shaded.

Rails.—We note the sale of 10,000 tons of steel rails to the Chicago and North Western Railroad Company for bonds at a private price, and 5,000 tons to the Chicago and Alton Railroad on private terms by the Joliet Mill. There is a rumor that the Erie Railroad has placed an order for 4,000 tons of steel rails with the Pennsylvania steel works. The quotations are $72 50@$75 at the mills. In iron rails we learn of no transactions, and quote nominally at $48@$53 at the mills. A private letter, bearing date of London, December 12, says that rails can be secured at £7 for best Russian descriptions, which would be equal to £6 10/ for American.

Old Rails.—We learn of no transactions, and quote nominally at $29@$30.

Scrap Iron.—We note the sale of 880 tons on private terms, and quote at $28@$32.

Boston.

From the *Commercial Bulletin* of Dec. 19, 1874.

Pig has felt the indifference of foundrymen the past ten days to the extent of 50c. on a ton, good No. 1 Extra offering in round lots at from $27 25@27 50 on our wharf. We note one sale of 20 tons at $27 50 with a privilege on the balance of 100 tons. A little interest was excited early in the week by the announcement that the makers of one of the most popular brands were offering to deliver their No. 1 at Hoboken at $25, and another, later on, quoting $24 for extra No. 1. This is the lowest point yet known in this market. Some of the holders here are firm at $28@28 50, while a few still quote $31@33, but the latter get no business. There is nothing doing in foreigns.

Bar is without improvement, selling at a range of from 2¼@3c., while occasional evidences are shown that a shade under these prices is made. On common iron there is considerable inequality in prices, the Eastern mills offering as to quality from 2½c. @2¾c., while leading Western makers quote 2¼c., with 3cc. freight contracts.

Cleveland. Dec. 23, 1874.

Specially reported by Messrs. C. E. BINGHAM & Co., dealers in pig iron and iron ore

As will be seen below our quotations show a further decline.

No. 1, Bituminous	"		28 00@ ...
No. 2,	"	"	26 00@....
No. 1,	"	Gray Forge	24 00@....
No. 1, Lake Superior Charcoal			31 00@....
No. 2,	"	"	29 00@....
No. 3,	"	"	31 50@....
No 4,	"	"	33 00@....
Nos. 5 and 6	"		34 00@....
American Scotch, No. 1, Cherry Valley			33 00@....
"	"	No. 2	30 00@....

Cincinnati. Dec. 22, 1874.

Specially reported by Messrs. TRABER & AUBERT, commission merchants for the sale of pig iron, blooms, ore, etc.

The market for pig iron is very dull and prices remain unchanged. We quote;

CHARCOAL.

Hanging Rock, No. 1, Foundry		$28 00@30 00	4 mos
"	No. 2, "	26 00@27 00	4 mos
	Mill	25 00@26 00	4 mos
Tennesse No 1, Foundry		27 00@29 00	4 mos
Tennessee, No. 2	"	25 00@26 00	4 mos
"	Mill	24 00@25 00	4 mos
Missouri, No. 1, Foundry		30 00@31 00	4 mos

STONE COAL.

Ohio No. 1, Foundry		27 00@29 00	4 mos
" No. 2,	"	25 00@26 00	4 mos
Ohio Mill		24 00@25 00	4 mos
Missouri, No. 1, Foundry		28 00@30 00	4 mos
" No. 2,	"	26 00@27 00	4 mos
"	Mill	25 00@26 00	4 mos

CAR-WHEEL.

Hanging Rock, C. B		48 00@52 00	4 mos
Tennessee	"	45 00@48 00	4 mos
Missouri	"	45 00@48 00	4 mos
Alabama	"	45 00@48 00	4 mos

BLOOMS.

Charcoal	75 00@ 90 00	cash

SCRAP IRON.

Cast	75@ 1 00	cash
Wrought	1 25@ 1 50	cash

Indianapolis, Ind. Dec. 21, 1874.

Specially reported by NELSON KINGMAN, broker and dealer in pig iron, etc.

Continue quotations.

New Rails at mill	$56 00@58 00		
Old Rails "	28 00@30 00		
Hanging Rock Charcoal Pig No. 1 foundry	31 00@32 00	4	mos
" " " " " 2 "	29 00@30 00	4	mos
" " " Mill	27 00@28 00	4	mos

STONE COAL.

Indiana No. 1 Foundry pig Planet furn'e.	32 00@33 00	4	mos
" 2 " " "	30 00@32 00	4	mos
" 1 Forge " "	29 00@	4	mos
" 2 " " "	27 00@	4	mos
Ohio No. 1 Foundry pig	30 00@31 00	4	mos
" 2 "	29 00@30 00	4	mos
" 1 mill	26 00@27 00	4	mos
Merchant Bar, card rates		per lb. c.	2.60
1st quality C. H. No. 1 Boiler Plates, per lb.		5¾c.	3 mos
1st " Com. Sheet, for No. 24, W. G. "		4¾c.	3 mos
1st " Charcoal Sheet " " "		6 c.	3 mos
Best Bloom Galvanized Sheet, discount 20 per cent			cash.
2d quality " " " 30 "			cash.

f. o. b. in Indianapolis.

Louisville. Dec. 22, 1874.

Specially reported by GEORGE H. HULL, Esq.

The market is dull at quotations, and round lots cannot be sold except at some concession in price.

There is not much disposition to force iron on the market, and the sales are limited.

The usual time, 4 months, is allowed on the quotations below.

HOT BLAST—CHARCOAL.

No. 1 foundry, from Hanging Rock ores	$28 00@30 00		
No. 2 " " "	26 00@27 00		
No. 1, forge, " "	24 00@25 00		
No. 1, foundry, " Tennessee "	26 00@28 00		
No. 2 " " "	25 00@26 00		
No. 1, forge, " "	24 00@25 00		
No. 1, foundry, " Alabama "	26 00@28 00		
No. 1 " " Iron Mountain "	28 00@30 00		

HOT BLAST—STONECOAL.		
No. 1, foundry, from Missouri ores		29 00@30 00
No. 2, " " "		28 00@29 00
No. 1, forge " "		27 00@28 00
COLD BLAST—CHARCOAL.		
Wheel from Hanging Rock ores		40 00@50 00
" " Tennessee "		36 00@38 00
" " Alabama "		40 00@42 00
" " Georgia "		40 00@42 00
" " Missouri "		40 00@42 00
" " Kentucky "		30 00@42 00

San Francisco

From the *Commercial Herald* of Dec. 11.

The *Oriflamme* from Oregon, brought 57 tons Soft Pig Iron, which sold promptly at $46. We note the sale of 200 tons American Pig Iron, Hard, to arrive, at $42. This is what is called "Reson" No. 1 Extra, and is highly spoken of by foundrymen. We also note sales of 400 tons American White Pig Iron on the spot in lots at $59@60. We quote Scotch Pig Iron at $42 50@47 50, according to brand. The market is well supplied with lead of all kinds. Tin Plate is still neglected.

METALS.

NEW YORK, Dec. 24, 1874.

Bullion.—Fine silver bar is quoted at $1 26@$1 27, gold, per ounce, and fine gold bar at par ($20 67, gold, per ounce) to ¼ per cent. discount.

Copper.—The market has been very quiet. The sales amount to about 200,000 lb., at 23¼c @23½c., cash. There is but little copper offering, and nothing doing in futures. Yesterday's cable quotation was £84 10/ for Chili bars.

MESSRS. DADELSZEN & NORTH, under date of December 3d, say:

"Although prices of Chili bars show but little change from the quotations in our last circular, the position of the article has undergone a decided improvement, and a very large business has been done. The large purchases of furnace stuff made by the smelters at advancing prices, and mainly to arrive, would lead to the conclusion that those who should know the trade best have confidence in the article and in the stability of prices.

"The insinuations that the returns of stocks and deliveries had been manipulated to suit interested parties have had little effect on those who understand the trade, and the articles published on the subject only tend to confirm the extraordinary improvement that has taken place in the statistical position of the metal.

"The delivery during November was again very large, it being estimated at fully 7,000 tons from Liverpool, Swansea, London and Havre, while the total stocks afloat and spot show again a reduction of over 2,000 tons. The charters for October are telegraphed as being 4,800 tons, which is large, but as almost all is coming by sailing vessels instead of steamers, as has been the case lately, its effect on the trade cannot be felt for some time, although timid operators in the market have taken fright since they were known.

"Prices on the coast had advanced materially, but the uncertain way in which the telegraph now works renders reliable information difficult to be obtained.

"The generally accepted reason for our largely increased delivery of copper this year is, that the requirements for cartridge making and other sorts of war material have far exceeded expectation, and from the eagerness of foreign Governments to lay in large stocks, this is likely to continue."

The following are the stocks on the 1st December:

	Nov. 1st 1874.	Dec. 1st, 1874.	Dec. 1st, 1873	Dec. 1st, 1872.
	Tons.	Tons.	Tons.	Tons.
Stock, Liverpool and Swansea,	12,700	10,800	22,100	23,400
Stock, Havre	3,427	3,720	1,800	180
" London	4,849	5,031	5,216	7,300
	20,976	19,551	29,116	30,880
Chili Produce, afloat and chartered,	8,000	7,400	6,385	9,400
Total	28,976	26,951	35,501	40 280

Tin.—The transactions have only been in a very small way The market, however, is firm at 22½c for Straits; 22c. for Refined; 21¾c. for L. and F, and 26c. for Banca, all gold. The latest London quotations were: Straits, £94; L. and F., £99@£100. At Penang, $24½ per picul is the quotation. There is an active demand for America, some large lots having been bought for shipment. Messrs. DADELSZEN & NORTH, under date of the 3d inst., report as follows:

"We have to report a steady trade, with an average amount of business both in Straits and Australian tin. The market has been devoid of heavy fluctuations, and the difference in price between the highest and lowest point has not exceeded £2 per ton. Consumption here has been good, as shown by the deliveries, which amount to 740 tons from London Warehouse. Those in Holland show a considerable falling off compared with last month, and amount to only 269 tons Banca, and 91 tons Billiton, of which 10 tons came to London, making the total for November 1,090 tons

"The advices regarding future supply of Australian tin are still very contradictory, but the shipments up to last advices show but little diminution. We estimate the quantity now afloat at 1,000 tons.

"The quantity of tin here and in Holland and afloat on 1st December, 1874, was as follows, compared with the three preceding months and the three preceding years:

	Sept. 1st, 1874.	Oct. 1st, 1874.	Nov. 1st, 1874.	Dec. 1st, 1874.
	Tons.	Tons.	Tons.	Tons.
Banca on Warrants	341	898	460	834
Arrived for next sales	4,715	4,144	4,153	3,796
Afloat " "	155	140	384	268
Billiton in Holland	847	933	774	1,048
Afloat	576	256	768	380
Foreign Tin in London Warehouse,	2,500	2,581	2,400	2,590
Foreign not landed	265	77	552	110
Straits afloat, per Telegraph,	425	950	950	1,100
Total	9,824	9,979	10,441	10,126

"In tin plates the makers have sold freely for shipment to America; but prices are easier. The make must now be fully up to the average of the busy times."

The transactions of this market, in tin plates, have been fair at prices the same as last quoted.

Lead.—We note a sale of 50 tons of Domestic Lead at $6 12½, at which price 20-ton lots can be purchased, although for smaller quantities about $6 20 is being paid. Selby is still holding at $6 35, while it is impossible to say what figure the government would accept. We continue to quote Foreign at 6¾c.

Spelter and Zinc.—There is nothing doing in spelter, which is quoted at 6¾c.@7¼c. gold, for foreign, and domestic at 6¾c.@6¾c. currency. There is little business doing in sheet zinc, which is firmly held at 9¼c @9½c., gold.

Antimony.—There is but little in the market, and it is being held at 12½c. gold, with every prospect of higher prices. The London quotation by cable is £52.

Manganese.—There is no pyrolusite in the market. N. B. manganite is quoted at 3c. gold, per lb.; Georgia, 2½c.; and Virginia psilomelane, 2c.

Quicksilver.—This article is without change, the quotations being $1 65 per lb. in this city; $1 55 in San Francisco, and £26 per flask (75 lb.) in London. "The San Francisco *Commercial Herald* of Dec. 11, says: The supply at the moment is greatly restricted by reason of bad roads. The production of newly opened mines is steadily increasing, promising, in the year to come, immense results. The present price is $1 55. The steamer for Australia carried 50 flasks."

Miscellaneous Stocks.

NEW YORK, Dec. 23, 1874.

A generally firmer feeling characterizes the following list as compared with our last. The transactions during the period under review have not been quite up to the average. Our quotations of the Philadelphia items represent the closing prices on the 21st, the market closing steady. A dividend of 2½ per cent. has been declared by the St. Nicholas Coal Co., payable on the 4th of January. The Delaware, Lackawanna and Western R. R. announces a quarterly dividend of 2½ per cent., payable January 20.

Schuylkill Nav. 6s. 1882, at 90.		
New Jersey Central R. R. Co	—	108¼
American Coal Co	—	—
Maryland Coal Co	—	19
Pennsylvania Coal Co	—	245
Quicksilver Mining Co. Preferred	—	44
" " " Common	—	34⅛
Reading R. R. Co	—	55
Delaware and Hudson Canal Co	—	116
Lehigh Coal and Navigation Co	—	48¼
Lehigh Valley R. R. Co	—	61⅞
Catawissa Preferred	—	40
Delaware, Lackawanna & West. R.R.Co.	—	108½
Consolidated Coal Co*	—	43⅛
Little Schuylkill R. R.		48¾
Huntington & Broad Top R. R. prefrd.	—	12
St. Louis & Iron Mountain	—	26¼
Susquehanna Canal	—	6
Delaware Division Canal	—	—
Spring Mt. Coal Co	—	—
Cumberland Coal and Iron Co	—	—
N. Y. & Nova Scotia Iron Co	—	—

* Ex-dividend.

Boston Stock Market.

BOSTON, Dec. 23, 1874.

An advance of $2¼ per share of the Calumet & Hecla Co. is the only feature of interest in the following report. The market has been almost wholly devoid of animation during the past week. We note a sale of 50 shares of Petherick on the 22nd. inst. at $1 50 per share. On the same day slight transactions of Copper Falls and Quincy transpired at our quotations.

Allouez	10	Pewabic	—
Calumet and Hecla Co.	140	Phœnix	13
Copper Falls	13	Quincy	44
Central	26	Ridge	7
Franklin	—	Rockland	1

San Francisco Stock Market.

An unparalleled advance has taken place in the following list during the transactions of the past week. The principal items in the upward movement are Consolidated Virginia, California and Ophir. The Consolidated Virginia shares are quoted $180 in advance of our last report. California is selling $170 per share higher, and Ophir is placed $86 above our report dated the 16th inst. Each one of these three mining companies has issued 100 800 shares of stock which will bring their aggregate advance during the period under review to nearly $44,000,000 This wonderful advance is, of course, principally due to the continued remarkable developments in the Comstock lode. Some of the ore recently taken from the Ophir mine, for example, assays from $8,000 to $9,000 per ton. The yield of this mine is about 240 tons per day, averaging $80 to $111 per ton The ore of the Con. Virginia Mine will possibly average from the richest parts $300 per ton. The product of the mine ranges from 2,000 to 2,500 tons per week. The California and Consolidated Virginia shares reached the highest point on the 21st inst., each of which changed hands at the remarkable figure of $500 per share. The following day brought a decline of $30 in Consolidated Virginia and $50 in California.

The general market, in sympathy with the favorite stocks, with but few exceptions, shows a very decided advance. Crown Point is $5 lower, and Kentuck and Raymond & Ely exhibit a decline of $1 per share each. Belcher is unchanged. The Belcher Mining Co. has disbursed $13,500,000 in dividends during its existence, showing the most honorable record of any item on the San Francisco Stock list.

The following extract from the *Scientific Press* of the 12th December, is of interest, though at that date the excitement had not, and possible has not yet, attained its maximum.

"The mining stock market has been in a state of great excitement during the past week, caused by the recent wonderful developments on the Comstock lode. Of course developments like these would put stocks up in spite of anything. The old Comstock lode, which has always been considered a wonder, will make itself even more famous; if we believe only half of the stories of the new strikes, there is still something unparalleled in the history of mining on this coast or anywhere else. All this is good for California, as the Comstock is owned principally by citizens of this State, who invest their earnings here.

"The excitement on the streets here with regard to the developments and prices of stocks has been intense. California street has been crowded with anxious speculators, all eager to get hold of some of the "good things." Of course, California, Consolidated Virginia and Ophir have been the favorites. No one seems to take any notice of the long list of assessments levied this week, though the million dollars to be disbursed as dividends next week will more than compensate for them. California and Ophir ought now to be added to the list of dividend paying mines, and if reports are true should pay larger dividends than even Belcher and Crown Point.

"The Ophir company have divided their ground and given 600 feet to the Mexican company, Ophir shareholders receiving shares in the Mexican pro rata to the number now held. Ophir now has 675 feet, and Mexican 600 feet. Both companies have a capital of $10,080,000 in 100, 800 shares.

"The developments at the north end of the Comstock have affected the prices of all the stocks on the line as a matter of course. How long the present excitement will continue it is impossible to tell, but it will probably occur again as soon as a new strike is made."

The following quotations are per telegraph, under date of December 22:

Gould & Curry	55	California	450
Savage	132	Overman	75
Chollar Potosi	91	Raymond & Ely	22
Ophir	185	Eureka C. V	8
Hale and Norcross	64	Best & Belcher	58
Crown Point	42	Kentuck	20
Yellow Jacket	160	Meadow Valley	6
Belcher	45	Alpha	28
Imperial	16	Sierra Nevada	25
Consolidated Virginia	470	Union Consolidated	82

Wise Words from Practical Men.

My success is owing to my liberality in advertising.—BONNER.

I advertised my productions and made money.—NICHOLAS LONGWORTH.

Constant and persistent advertising is a sure prelude to wealth.—STEPHEN GIRARD.

He who invests one dollar in business should invest one dollar in advertising that business.—A. T. STEWART.

Advertising has furnished me with a competence.—AMOS LAWRENCE.

133d Auction Sale.

30,000

TONS SCRANTON COAL,

On WEDNESDAY, DECEMBER 30th, 1874.

NEW YORK, December 30th, 1874.

The Delaware, Lackawanna and Western Railroad Company will sell, by MESSRS. JOHN H. DRAPER & CO., Auctioneers, at the Company's Sales Room, 26 EXCHANGE PLACE, corner of William Street, NEW YORK, on WEDNESDAY, December 30th, at 12 o'clock, noon,

30,000 TONS

OF

COAL, FROM THE LACKAWANNA REGIONS,

of the usual sizes, deliverable at the option of the Company at their Coal Docks either at Hoboken or Elizabethport during the month of January, 1874.

The sale will be positive; each lot put up will be sold to the highest bidder; no bids, in any form whatever, being made for account of, or on behalf of, the Company. The conditions will be fully made known at the time of sale.

TERMS: FIFTY CENTS PER TON, payable in current funds, the day of sale, and the balance, within ten days thereafter, at the office of the Company.

SAMUEL SLOAN, President.

MISCELLANEOUS.

"Not only the ablest and best, but, as we suppose, the most popular, of American religious periodicals."—*The Nation.*

THE FAVORITE FAMILY JOURNAL.

THE CHRISTIAN UNION

An Unsectarian, Independent Weekly Newspaper, with Attractions for every Member of the Household.

HENRY WARD BEECHER, Editor.

This paper has been able, through its growing prosperity year after year, to gather a select and popular list of contributors, familiar to all readers of the best literature of the day. It is conducted by a corps of skilled journalists, under the immediate direction and guidance of Mr. Beecher.

It is a Religious Paper, using the Bible not as an armory for theological warfare, but as a storehouse of spiritual food and refreshment; preaching the Gospel of "Good will"—the Fatherhood of God and the Brotherhood of Men—as the essence of Christianity.

It is a News Paper, giving each week a compact, terse review of events in the Church and the World, both in America and abroad; a digest of new points of interest in Educational, Scientific and Sanitary matters; and of fresh topics concerning the Farm and Garden and the Financial Market.

It is a Story Paper. It *always* has in progress a popular Serial, having now under way Mrs. Stowe's new novel. "*We and Our Neighbors*". This has been running since last May, but to all subscribers previous to Jan. 15, 1875, will be sent an *Illustrated Supplement* containing *all* the back chapters. Beside serials, the paper is constantly brightened by a succession of capital Short Stories by favorite writers, some of them Illustrated.

It is a Paper for Thinkers. Some of the first minds in America contribute to its columns, and men interested in the great topics of the day—Religion, History, Science, Politics, Finance, Sociology, Reform—will here find carefully prepared editorial and contributed articles.

It is a Literary Paper, giving much attention to "Books and Authors," reviewing all books worthy of note, and keeping before its readers fresh literary information. It takes interest also in matters of Art, of Music, and generally in all that elevates and refines.

It is a Home Paper. From the first there has been a special aim to win for the paper a welcome to *Families;* and, among other matters, particular pains have been taken to have the Household constantly represented by special articles, with a succession of papers treating of matters that every Housekeeper is interested in. It has also every week an especial provision of Stories, Poems, attractive articles, ingenious Puzzles, and other things for the young folks. In short,

IT IS A FAMILY PAPER,

With interest for every member of the Household; and the earnestness of this aim, and the purity and truthfulness and Christian kindness of its tone, have gained for the paper a wonderful success, and given it, of its class, the

Largest Circulation in the World.

During the ensuing year the CHRISTIAN UNION will introduce a new feature, and give

Illustrated Articles

in the first number of every month. These numbers will contain some new original article—Fiction—Poetry—Science—Architecture—Music—Landscape Gardening, etc., from able writers, *Illustrated,* aptly and brilliantly. The subscription,

Only $3 per annum,

really buys, every week, for less than 5 cents, an amount of reading matter, that would make a 12mo *book over* 100 *pages!* The brain work on every week's number costs over a *thousand dollars.*

With the paper is presented to the subscriber one of the following.

PICTURE-PREMIUMS:

1. Marshall's magnificent steel plate known as "**The Household Engraving of Washington**"—a work which instantly placed Mr. Marshall in the front rank of the world's engravers, and which extorted the admiration of America and Europe.

2. Marshall's large and superbly engraved steel plate "**The People's Portrait Inc n.**" This striking portrait of the "Martyr-President" was, with the "**Washington,**" sent by Mr. Marshall to Doré, the great French artist, who was so impressed that he begged Mr. Marshall to engrave one of his pictures, calling him "the undoubted master of his art." Selling price, $10.

3. "The Lord is Risen," a choice French reproduction in oil-chromo of a painting of an "Easter Cross" wreathed with spring flowers—emblems of the Resurrection. This large chromo sells for $5, and is really a beautiful picture.

4. "Our Boys; *The Dinner, and The Nap*"—a *pair* of French oil chromos after Mrs. Anderson's admirable child pictures—for which she has a true genius. These are pretty companions for the earlier and even more popular pair, known as

"5. Our Girls; *Wide Awake and Fast Asleep,*" of which we have sent out more than 180,000 pairs to American homes, and which are still given to subscribers.

Of these, Nos. **2, 3, 4** and **5** will be delivered post paid by mail on receipt by the Publishes of **50 cents** from the subscriber, to defray expenses.

No. **1** will be sent on receipt of **25 cents** for packing and postage.

Postage

On the Paper, as required by the new U. S. Law, must be prepaid in New York, instead of at the subscriber's post-office. To all subscription moneys, therefore, add **20 Cents** for postage.

Specimen Copies, giving *Club Rates,* etc., sent on receipt of 2 cents for postage.

Our New Illustrated Premium Circular, showing all the choice premiums offered canvassers, will be sent on application; also *Terms for Agents* and *Cash Commissions.*

N. B.—All remittances must be made in check, draft on New York, Registered Letter, or (best of all) Postal Money Order. *Currency is mailed at the risk of the sender.*

J. B. FORD & CO, Publishers,

27 Park Place, New York.

GOOD AGENTS WANTED.

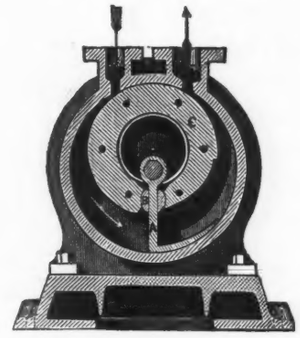
PATENT FOR SALE.

The Climax Composition and Patent Paint, for removing and preventing incrustation, however thick, in Steam Boilers of every description. Has been thoroughly tried and tested by the largest steam users in England. The paint is remarkably cheap, and will alone keep boilers, &c., free for six months or more. Patent right for America to be sold. For full particulars apply at the Works, 109 Victoria street, Birkenhead, Eng.

Completely Victorious at the Recent Tests of Rotary Engines at the American Institute Fair!

BEAT THE LIDGERWOOD, MASSEY AND GALLAHUE MACHINES BY A LARGE PERCENTAGE—OFFICIAL REPORT SOON TO BE PUBLISHED!!

THE MYERS ROTARY ENGINE.



Only three working parts. A is the piston, which is attached directly to the shaft, and which passes through the oscillating piece, B, of the ring C. Power is not transmitted through the ring, which only serves as an abutment and guide, and to give capacity to the cylinder. The arrows show the course of the steam. NOISELESS IN OPERATION. NO SPRINGS. NO SOLID DRUM. NO CAMS. NO INTRICATE VALVE-GEAR. NO BRAKES. NO CLUTCHES. ONE LEVER. BROAD BEARING SURFACES. Perfectly durable. Strongly constructed and simple to pack. Occupies a minimum of floor space. The best hoister for mines, wharves, elevators, or any other purpose. Reverses instantly, and holds the load at any point. Address

THE MYERS ROTARY ENGINE CO.,

No. 6 Cortlandt Street, New York City.

As a medium of advertising, the advantages of

The Engineering and Mining Journal.

are well known.

It is the official organ of THE AMERICAN INSTITUTE OF MINING ENGINEERS, publishes all its papers and proceedings, and is received and preserved by all the members, American and foreign, of that large and influential Society, the only one of the kind in this country.

It gives more full, trustworthy and practical information on all subjects connected with our Coal and Iron industries than any other paper in America. It has the largest circulation of any mining and metallurgical paper in America.

Its editors are Engineers of long practical experience, and are constantly applied to for advice on the purchase of mine supplies—machinery, coal, etc., etc.

It is filed and bound by its subscribers, and is thus doubly valuable as a permanent means of keeping an advertisement before the public.

Address the

SCIENTIFIC PUBLISHING COMPANY,
WILLIAM VENTZ, Secretary,

To whom all business communications, checks and Post Office orders should be addressed.

27 Park Place, New York City.

P. O. Box 4404.

RIEHLE BROS.,

650 North Ninth Street, Philadelphia.

New York, 93 Liberty St., Pittsburgh Store, 285 Liberty Street

SCALES

The Celebrated Stock House Scale, New Style Testing Machines, All Sizes. Iron Lever Railroad Track Scales. Patented First Power Lever Wagon Scale, for Coal Dealers. Parallel Crane Beams and Mortising Machines. Hydraulic Jacks.

FOR SALE CHEAP.

A CAMERON STEAM PUMP. Steam cylinders 18 inches, water cylinder 12 inches, stroke 5 feet.

As good as new.

For further particulars inquire of ISAAC H. SHEARMAN, 45 Cortlandt street, New York, or of

GEO. B. WHEELER, Superintendent of Water Works, New Bedford, Mass.

WOOD ENGRAVING

EXECUTED AT THE OFFICE OF

The Engineering and Mining Journal,

27 PARK PLACE, NEW YORK CITY.

COAL SHIPPERS.

COXE BROS. & CO., CROSS CREEK COLLIERY, MINers and Shippers of the Celebrated

Cross Creek Free Burning Lehigh Red Ash COAL.

FROM THE BUCK MOUNTAIN VEIN.

Unexcelled for Steam, Sugar House and Domestic use.

WESTON, DODSON & CO., Sole Agents,

General Office: Bethlehem, Pa.
Branch Office: 205 South Fourth street, Philadelphia,
Agents in New York, MEEKER & DEAN,
Room 16 and 18 Trinity Building.

WILKESBARRE COAL,

DELIVERED DIRECT FROM THE MINES OF

THE WILKESBARRE COAL AND IRON COMPANY,

OR FOR RE-SHIPMENT AT

Port Johnston and Hoboken.

OFFICE, 80 BROADWAY, NEW YORK.
Dec. 23-1y

C. A. BLAKE & CO.,

Agents for the sale of

Hillside Coal and Iron Company's

COAL.

Docks for the receiving and shipping of Coal and other heavy freights.

OFFICES:

BUFFALO,

7 Main street,

Waverley, opposite Erie Railway Depot.

RED BANK MINING COMPANY

ARE PREPARED TO SUPPLY THEIR

GAS COAL AND CANNEL

from their Colliery near Bethlehem, Clarion County, Pa. These mines are situated directly on the line of the Bennett Branch of the Alleghany Valley R. R. (just completed) and only 20 miles from its junction with the Main Line at Red Bank. This position enables them to supply Gas Companies **in any part of New York State, and Northern Pennsylvania, by Rail direct from the Colliery at all seasons of the year**—or to points on the **Canals or Lakes,** during navigation, *via* **Buffalo or Erie.**

The **Gas Coal** (Red Bank Orrel) is specially adapted to **Gas Manufacture,** its yield being as large as that of any Caking Coal in the market, of easy purification and good illuminating power.

The Cannel is superior to any of the Ohio Cannels obtainable, and can be delivered in any required quantity, from one car upwards. For particulars as to price, etc., apply to

BIRD, PERKINS & JOB,

P. O. Box 5623. GENERAL AGENTS, 27 South st., N. Y.

DETMOLD & COX,

ANTHRACITE AND BITUMINOUS COALS.

OFFICE:

40 TRINITY BUILDING, NEW YORK.
January 23:1y

BORDA & KELLER,

KOH-I-NOOR COAL.

Old Company—Lehigh—Wilkes-Barre—Plymouth, Red Ash—on board at Philadelphia.

OFFICES:

346 Walnut St., Philadelphia
77 State St., 5 Doane St., } **Boston,**
Wharf No. 4, Port Richmond.

"GIFFARD'S INJECTOR" BOILER FEEDER—Sellers' New Improvements.

New Patterns, Simple, Effective.

No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.	No. 10.
10 H. P.	25 H. P.	45 H. P.	70 H. P.	100 H. P.	140 H. P.	190 H. P.	275 H. P.
$18.	**$25.**	**$35.**	**$45.**	**$55.**	**$65.**	**$75.**	**$95.1**

WM. SELLERS & CO., Philadelphia.

Send for circular giving particulars.

New York Office, 93 Liberty Street.

THE FAVORITE FUEL.

Combining all the Merits of Cannel and

Anthracite without their Faults.

It burns freely, like Cannel Coal, without smoke, sulphur, or bituminous odor, enduring longer than anthracite. Ninety-six per cent. combustible, two and one-quarter per cent. ashes.

THE JAMES RIVER COAL CO.,

Room E, 111 Broadway, New York,
and 8 Pemberton Square, Boston.

FREDERIC A. POTTS,

WHOLESALE

COAL AND IRON MERCHANT.

ANTHRACITE AND BITUMINOUS COALS,

Embracing Old Company Lehigh (Summit Hill), Room Run, (Free Burning White Ash), Plymouth Wyoming Red Ash Coal, also the celebrated Baltimore vein Wilkesbarre Coal, Hampshire and Barton George's Creek Coal.

OFFICES;

110 Broadway, New York,

P. O. Box 3404,
METROPOLITAN BANK BUILDING,
No. 33 Westminster Street, Providence.
July 4-1y

WM. BORDEN. L. N. LOVELL.

BORDEN & LOVELL,

CUMBERLAND COAL,

FOR RAILROAD, STEAMSHIP AND GENERAL USES.

Unexcelled in quality by any from this region. Shipments made at Georgetown, D. C.; Baltimore, Md.; South Amboy, N.J

OFFICES;

No. 70 and 71 WEST STREET, NEW YORK.

AGENTS FOR THE SALE OF

FALL RIVER IRON WORKS COMPANY'S NAILS, BANDS, HOOPS AND RODS.

STEPHEN S. LEE & SON.,

Miners and Shippers of

GEORGE'S CREEK COAL.

SWANTON MINES,

No. 49 West Lombard street,
BALTIMORE.

BIRD, PERKINS & JOB.

GAS COALS AND CANNEL.

FROM THE

Westmoreland—Cannelton—Red Bank—Youghiogheny and Provincial Mines.

103 State St., Boston.,
27 South St., New York.

MARYLAND COAL CO.

MINERS AND SHIPPERS OF

GEORGE'S CREEK CUMBERLAND COAL.

OFFICES

Nos. 15 & 17 Trinity Building, New York.

BALTIMORE COPPER WORKS

(Canton.)

POPE, COLE & CO.

ARE NOW PURCHASING

COPPER ORES,

and smelting and refining at these extensive works, where, with experienced workmen and extraordinary facilities, we are turning out Ingot and Cake Copper of unequalled purity and toughness.

We are prepared to buy *Ores*, Matte, Regulus and other furnace material, in any quantities.

At *Salt Lake City*, Mr. Geo. J. Johnson, our representative, will receive, sample, assay and pay cash for ores of that vicinity

In *San Francisco* we are likewise represented by Mr. Horace D. Ranlett, 218 California street.

Office, No. 57 South Gay street, *Baltimore, Md.*

OLIVER'S POWDER.

This Powder recommends itself for its

SUPERIOR STRENGTH

and

FREEDOM FROM SMOKE

Direct orders to

PAUL A. OLIVER,

dec9-1y WILKESBARRE, PENN.

EDWARD W. COIT,

IRON AND METAL

COMMISSION MERCHANT,

BOILER PLATES, BOILER TUBES
STRIP PLATES, SPECIALS.

No. 205½ Walnut street,
PHILADELPHIA, PA.

D. ERNEST MELLISS, A. M., Ph. D.,

52 BROADWAY, NEW YORK,

MINING ENGINEER AND GEOLOGIST,

Analytical and Consulting Chemist.

REFERENCES: W. Butler Duncan, Esq., (*Duncan, Sherman & Co.*); John J. Cisco, Esq., (*John J. Cisco & Son*); Walter Williams, Esq., (*Chairman Staffordshire Iron Masters' Association, England*); Charles F. Chandler, Ph. D., (*Dean of Faculty, School of Mines, New York*); Charles A. Joy, Ph. D., (*Professor Chemistry, Columbia College, New York*); J. A. Newberry, M. D., (*Professor Geology, School of Mines, New York*); C. P. Huntington, (*President C. & O. R. R.*)

SCHOOL OF MINES, COLUMBIA COLLEGE.

FACULTY.—F. A. P. BARNARD, S.T.D., LL.D., PRESIDENT. T. EGLESTON, JR., E.M., Mineralogy and Metallurgy; P. L. VINTON, E.M., Civil and Mining Engineer; C. F. CHANDLER, PH. D., Analytical and Applied Chemistry; JOHN TORREY, M.D., LL.D., Botany; C. A. JOY, PH. D., General Chemistry, W. G. PECK, LL.D., Mechanics; J. H. VAN AMRINGE, A.M., Mathematics; O. N. ROOD, A.M., Physics; J. S. NEWBERRY, M.D. LL.D., Geology and Paleontology. Regular courses in Civil and Mining Engineering; Metallurgy; Geology and Natural History; Analytical and Applied Chemistry. Special students received for any of the branches taught. Particular attention paid to Assaying. For further information and catalogues, apply to

DR. C. F. CHANDLER,
Nov.21::y Dean of the Faculty.

BLOW-PIPE APPARATUS FOR SALE.

A complete LINKE'S Apparatus, new, and with full set of pure re-agents, to be sold at less than cost in Germany. Address "BLOW-PIPE," office ENGINEERING AND MINING JOURNAL.

MISCELLANEOUS.

HALLIDIE'S
ENDLESS WIRE ROPEWAY,

[WIRE TRAMWAY,]

FOR THE

Rapid and Economical Transportation of

ORES, STONE, COAL, Etc., Etc,

OVER MOUNTAINOUS ROADS.

Covered by numerous United States Patents.

☞ Has been in use over two years on the Pacific Coast, and is the most effective system ever matured.

The Superintendent of the Emma Hill Consolidated Mining Co., Utah, says: "The line has been working since August, 1872; is as good to-day as when built. No other system could do the work as cheaply or as well."

The Superintendent of the Chicago Silver Mining Co., Salt Lake, says: "For transporting ores down our rough cañons and rugged mountains, there is nothing yet devised that will compare with it, for long and short distances."

The Superintendent of the Morning Star Mining Co., of Freiberg, Nevada, says: "It is a perfect success, discharging ten tons of ore per hour with two men's labor."

Send for Circular to

A. S. HALLIDIE,

No. 113 PINE STREET, San Francisco, Cal.

MANUFACTURERS OF MACHINIST'S TOOLS OF EVERY DESCRIPTION — NEW YORK STEAM ENGINE CO. — 98 CHAMBERS ST. N.Y.

Having added a

SCOTT'S GEAR MOULDING MACHINE

To our Foundry, we are now prepared to furnish,

WITHOUT CHARGE FOR PATTERNS,

GEAR-WHEELS

OF ALL DESCRIPTIONS,

AT THE

SHORTEST NOTICE.

Work warranted perfectly accurate. Send for circular giving price, and directions for ordering.

N. Y. Steam Engine Co.,

98 Chambers St.,

N. Y.

The Fletcherville Blast Furnace Co.

Manufacture Charcoal Pig Iron exclusively from New-Bed Pure Magnetic Ore, suitable for Bessemer, Malleable and Car-wheel purposes, or for Foundry use where very soft and strong iron is required.

Analysis of Average New Bed Pure Ore.

Metallic iron	68.24
Oxygen with the iron	26.01
Water	.38
Insoluble Siliceous matter	4.32
Sulphur	practically none.
Phosphorus	.038
Alumina	.28
Lime	.14
Undetermined matter and loss	.592
	100.000

Analysis of No. 1 Bessemer Pig.

Undetermined matter and loss	.134
Silicon	1.019
Carbon	3.821
Phosphorus	.048
Sulphur	practically none.
Calcium	.140
Metallic iron	94.838
	100.000

WITHERBEES & FLETCHER,

Port Henry, Essex County, N. Y.

Furnace at Fletcherville, near Mineville N. Y.

Colorado Bureau of Mines,

383 Larimer Street,

DENVER, COL

Authentic Statistics of Mines and Mining Property in Colorado compiled and recorded.

Mining Property bought and sold on Commission.

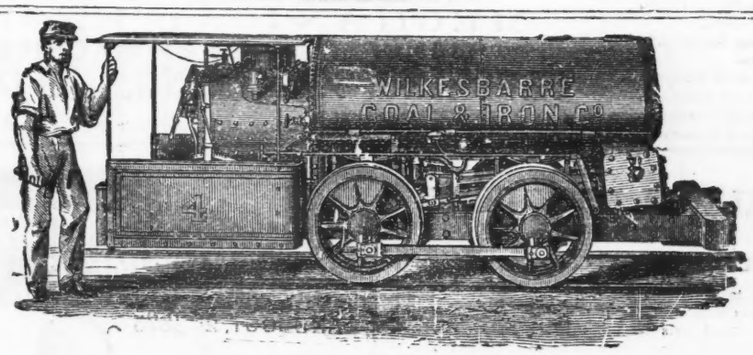
Reliable information given upon application by parties interested.

Address as above.

HIERO B. HERR,
Consulting Engineer and Sup't.

E. F. ADAMS,
Engineer and Assayer.

MISCELLANEOUS.



IMPROVED DIRECT-ACTING MINING LOCOMOTIVES.

Gauge, two feet six inches or upwards; Height above rail, five feet four inches; Width over all, five feet one inch Adapted to burn Anthracite or Bituminous coal or coke.

Materials and Workmanship Equal to those in Full Gauge Railroad Locomotives,

Guaranteed to pass curves of twenty-five feet radius and haul, on a level track in good condition,

Three Hundred and Forty Gross Tons of Cars and Load.

For Photograph and full particulars, address **BURNHAM, PARRY, WILLIAMS & CO.**

Feb 7-1y:eow Baldwin Locomotive Works, Philadelphia.

COUNCIL BLUFFS IRON WORKS,

CAPITAL, $100,000.

Manufacturers of Mining Machinery, Quartz Mills, Smelting Furnaces, Pumping and Hoisting Machinery,

IRON AND BRASS CASTINGS OF ALL KINDS.

OFFICE AND WORKS LOCATED AT COUNCIL BLUFFS, IOWA, at the Eastern Terminus of the Union Pacific Railroad.

jan17-1y Address **H. J. CORY, Secretary.**

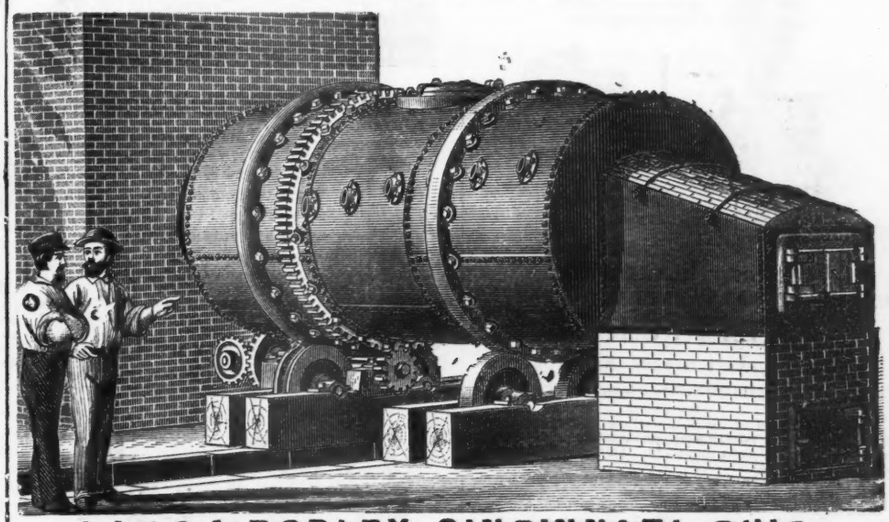
LEHICH ZINC COMPANY.

GORDON MONGES, Treasurer. B. C. WEBSTER, President.

WORKS, BETHLEHEM, PA. OFFICE, 333 Walnut Street. Philadelphia.

JOHN JEWETT & SONS, AGENTS, 182 FRONT STREET, NEW YORK.

OXIDE OF ZINC, SPELTER, SHEET ZINC.



LANE & BODLEY, CINCINNATI, OHIO,

SOLE MANUFACTURERS

OF

BRÜCKNER'S PATENT

REVOLVING CYLINDERS

For Roasting, Desulphurizing and Chloridizing Ores. Also Steam Engines, Boilers, Saw Mills and Mining Machinery.

Illustrated catalogues and prices furnished on application.

LANE & BODLEY,
John and Water sts., Cincinnati.

Jaw Crushers.
Steel Crushing Rolls.
Concentrators.
Revolving Screens.
Elevators.
Hangers and Shafting.
Pulleys and Belting.
Laboratory Crushers.
Laboratory Concentrators.

STEPHEN R. KROM,
MECHANICAL ENGINEER,
MANUFACTURER OF MACHINERY FOR
CRUSHING, SCREENING, AD CONCENTRATION OF ORES,
For Pamphlets and information, address: S. R. KROM, 206 Eldridge St., New York.

PLANS FURNISHED FOR Ore Dressing Works.

THE
BURLEIGH ROCK DRILL COMPANY,
FITCHBURG, MASS.

Continues to manufacture the only reliable and economical Rock Drill yet invented. Send for our pamphlets giving certificates of use in all parts of the United States and Europe.

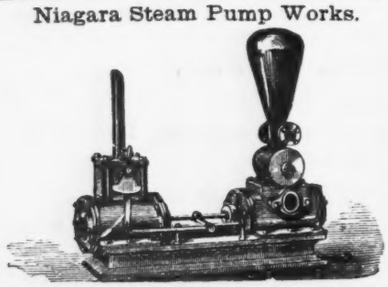
We give below an extract from the affidavit of WALTER SHANLY, Contractor at Hoosac Tunnel, used in our suit now pending against the Ingersoll Drill for infringement:

"The cost of repairs of the Burleigh Drill is, in my opinion, reasonable, the simplicity of the construction of the machine tending to keep down the cost of repairs and renewals. I have had a machine work for three months without needing repairs, and in that time it drilled the same as a hole a mile long and of two inches diameter."

We can multiply evidence as to the efficiency and economy of this machine over all others; the insignificant cost of repairs being its particular advantage.

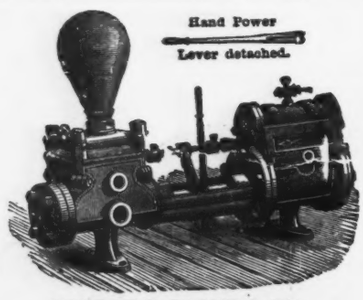
New York Office, 115 Liberty street.

Niagara Steam Pump Works.



This Pump has taken the first premium at every Fair in the United States where there has been a practical test.

CHARLES B. HARDICK,
No. 23 ADAMS STREET, BROOKLYN N. Y.
Sole Manufacturer of
HARDICK'S PATENT DOUBLE-ACTING
STEAM PUMPS AND FIRE ENGINES,
Patented in England, Belgium and France. Send for circular. feb-13-1y

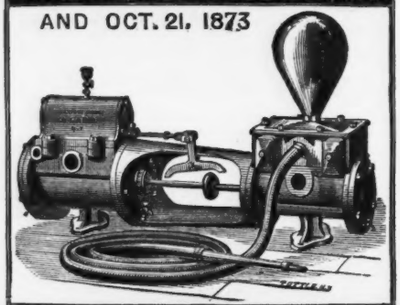


GEORGE F. BLAKE & CO.,
MANUFACTURERS OF BLAKE'S PATENT
STEAM PUMPS,
No. 79 LIBERTY STREET, NEW YORK.
Factory 61 Chardon St., Boston, Mass.

A specialty made of the manufacture of DOUBLE-ACTING PLUNGER PUMPS for mining purposes—combining economy of space, capacity, and great durability. All wearing parts made of composition metal.
Also, Boiler Feed Pumps, Fire Pumps, Tank Pumps, Wrecking Pumps, etc., etc.
Send for Illustrated Price Circular. m16 3m

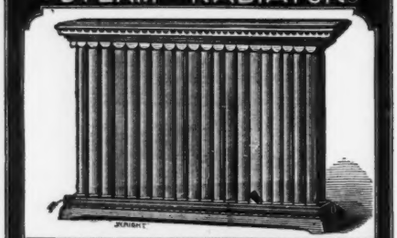
VIEWS OF BUILDINGS — PORTRAITS OF MACHINERY
CROSSCUP & WEST,
ENGRAVERS ON WOOD,
BOOK ILLUSTRATIONS — POSTERS SHOW CARDS
702 CHES'T. ST PHILA'A.

THE SELDEN DIRECT-ACTING
STEAM-PUMP
PAT. AUG. 2, 1870. DECEMBER 20, 1870
AND OCT. 21, 1873



COMBINING SIMPLICITY AND DURABILITY TO A REMARKABLE DEGREE. ITS PARTS ARE EASY OF ACCESS AND IT IS ADAPTED TO ALL PURPOSES FOR WHICH STEAM PUMPS ARE USED.

A. CARR
MANUFACTURER AND PROPRIETOR,
43 CORTLANDT ST. NEW YORK.
CARR'S POSITIVE CIRCULATING
STEAM RADIATOR



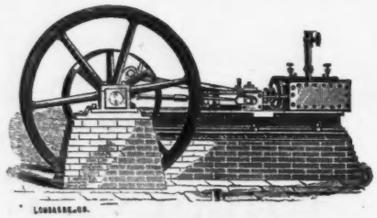
THE ONLY UPRIGHT STEAM RADIATOR MADE WHICH HAS A POSITIVE CIRCULATION.
ALSO
WROUGHT AND CAST IRON PIPE, BRASS WORK &c.
FOR
PLUMBERS, STEAM AND GAS FITTERS.
SEND FOR DESCRIPTIVE CIRCULAR & PRICE LISTS.

The Pulsometer.

The **simplest, most durable** and **effective** Steam Pump now in use. Will pump **gritty** or **muddy** water without wear or injury to its parts. It cannot get out of order.

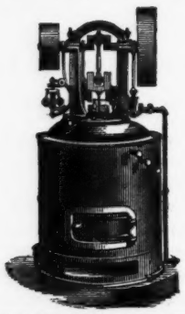
BRANCH DEPOTS:
104 Sudbury street, Boston,
1327 Market street, Philadelphia,
59 Wells street, Chicago,
South Western Exposition, New Orleans,
811 and 813 North Second street, St. Louis.

C. HENRY HALL & CO.,
20 Cortlandt Street, New York.



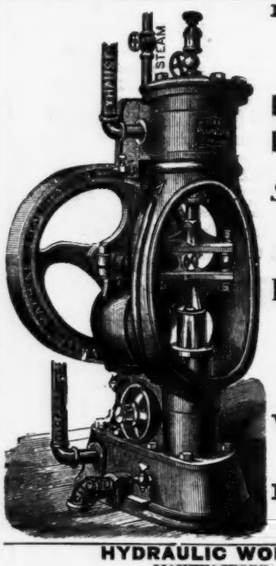
CAMPBELL & RICKARDS,
BUILDERS OF ENGINES AND TRAVELING CRANES
607 and 609 Commerce street, Philadelphia, Pa.
Estimates furnished on application.

THE BEST IS ALWAYS THE CHEAPEST.



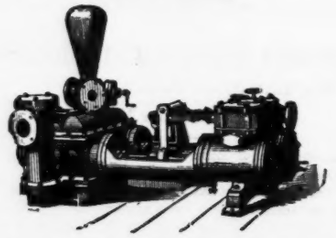
7 REASONS WHY
THE BAXTER PORTABLE ENGINES
ARE THE CHEAPEST IN THE WORLD.
1st—They have great STRENGTH.
2d—They have great DURABILITY.
3d—They are perfect in CONSTRUCTION.
4th—They are safe against FIRE AND EXPLOSION.
5th—They are ECONOMICAL IN SPACE AND FUEL.
6th—They have been before the public for six years, and over 1,000 of them are in use, and no accident to life, limb, or property has occurred.
7th—THEY ARE FULLY GUARANTEED IN ALL PARTICULARS.
For reduced price-list call on or address
WM. D. RUSSELL, 18 Park Place, New York.

Improved, 1874.



BUCKET-PLUNGER
Steam Pumps
ALWAYS RELIABLE.
MADE
BY THE
Valley Machine COMPANY,
Easthampton,
Massachusetts.

HYDRAULIC WORKS.
MANUFACTORY,
BROOKLYN, N. Y.
Steam Pumping Engines, Single and Duplex, Worthington's Patent, for all purposes, such as Water Works Engines, Condensing or Non-condensing; Air and Circulating Pumps, for Marine Engines; Blowing Engines; Vacuum Pumps, Stationary and Portable Steam Fire Engines; Boiler Feed Pumps, Wrecking Pumps,
MINING PUMPS.



Water Meters, Oil Meters; Water Pressure Engines. Steam and Gas Pipes, Valves, Fittings, etc. Iron and Brass Castings.
Send for Circular. H. R. WORTHINGTON,
Jan.2-1y 239 Broadway, New York

RICHARD P. ROTHWELL
Mining Engineer.
Office of the Engineering and Mining Journal,
27 PARK PLACE, NEW YORK.
Surveys, Examines and Reports on *Coal* and *Iron* Properties and Mines.
Advises on all questions of the Working and Management of Mines.

MAYNARD & VAN RENSSELAER,
Mining and Metallurgical Engineers,
Experts in Iron, Analytical Chemists,
34 Cliff Street, New York.
GEO. W. MAYNARD, SCHUYLER VAN RENSSELAER.

STUART M. BUCK,
MINING ENGINEER,
Kanawha and Ohio Coal Company.
COALBURG, WEST VIRGINIA.
Examines and reports on Coal Lands, and consults on the opening and working of Mines.

IRVING A. STEARNS,
MINING AND CIVIL ENGINEER,
Wilkes-Barre, Penn'a.
Examines and Surveys Mines and Mineral Properties.
Furnishes Working plans and Estimates for mines, improvements, and superintends the establishment and working of mines. Dec. 16-tf

RICHARD H. BUEL,
Mechanical Engineer,
80 BROADWAY.
Plans and estimates prepared. Machinery and processes examined and tested.

E. GYBBON SPILSBURY,
Consulting Civil & Mining Engineer.
Mining Properties examined and reported on. Plans and estimates made for every kind of Mining machinery.
The concentration of ores a specialty.
187 Broadway, Street level,
New York.

A. W. HALE, A. M., E. M.
CIVIL AND MINING ENGINEER,
AND
ANALYTICAL CHEMIST,
LABORATORY, 71 BROADWAY, NEW YORK.

C. A. STETEFELDT,
MINING ENGINEER
AND
METALLURGIST,
Office Stetefeldt Furnace Company,
No. 411½ CALIFORNIA STREET,
San Francisco, Cal.

THOMAS M. DROWN,
ANALYTICAL CHEMIST,
LAFAYETTE COLLEGE,
EASTON, PA.

BLASTING POWDER.
LAFLIN & RAND
POWDER COMPANY,
21 PARK ROW, NEW YORK.
P. O. Box, 2308.
Mills in several different States of the Union.
Manufacturers of the best Blasting Powder, and also of the celebrated
ORANGE SPORTING POWDER,
Known for many years as the best brands of the country.

THE IRON-MASTERS' LABORATORY.
Exclusively for the Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.
No. 339 Walnut Street, Philadelphia.
J. BLODGET BRITTON.

This Laboratory was established in 1866, at the instance of a number of practical Ironmasters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of pure Iron in an ordinary Ore	$4 00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do	12 50
For each additional constituent of usual occurrence	1 50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.	
For determining the per cent. of Sulphur and Phosphorus in Iron or Steel	12 50
For each additional constituent of usual occurrence	4 00
For the per cent. of Carbonate of Lime, and Insoluble Silicious Matter in a Limestone	10 00
For each additional constituent	2 00
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal	12 50
For determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal, the charges will correspond with those for the constituents of an ore.	
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.	
Printed instructions for obtaining proper average samples for analysis furnished upon application.	

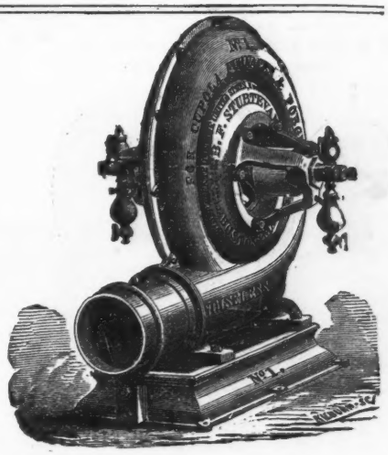
IRON AND COAL PROPERTIES
Examined and Reported upon for Practical Purposes, by Experienced and Thoroughly Competent Mining Engineers and Experts.
Jan. 6:tf

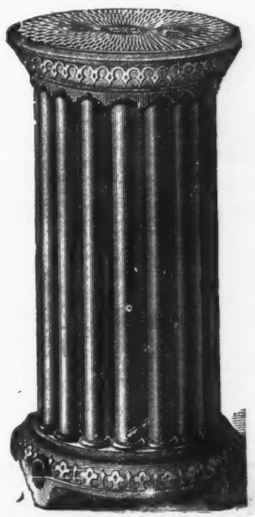
E. B. BENJAMIN,
10 BARCLAY STREET,
NEW YORK CITY,
Importer and Manufacturer of all kinds of apparatus for mineral and chemical analysis. *Laboratory and Assaying Tools, Prospecting and Mining Implements, accurate* Balances and Weights, Furnaces, Tongs, Freiberg Scorifiers, French Cupels and Assay Cups. Flasks, Dippers, *Crucibles*, etc. Complete *Blowpipe* sets for gold and silver tests, Compasses, Becker's Ingot Moulds, Lenses, Evaporators, etc., etc.
For better description of apparatus and prices, see the large *Illustrated Catalogue*, beautifully gotten up, in cloth.
Price - - - $1 50 per Copy.
1y-apr8

JAMES W. QUEEN & CO.,
601 Broadway, New York,
Manufacturing Opticians,
Transits, Levels, Drafting Instruments,
OF ALL KINDS.
TRACING PAPER.
CHESTERMAN'S STEEL AND METALLIC TAPES, &c., &c.
Catalogues sent to any address for 10 cents.
Mention MINING JOURNAL.

HELLER & BRIGHTLY, Engineering and Surveying Instruments, 33 N. Seventh St., Philadelphia.
Without decreasing size of any part of our "Engineers' Transit" we have reduced the weight one-half. An ordinary Transit Telescope magnifies from 10 to 12 diameters, our new Transit Telescope (length 10½ inches, shows objects erect and not inverted) magnifies 20 diameters and will read time on a watch dial at 963 feet. For description of our new Mining & Transit (weight 5½ lbs.) and Plummet Lamp see Van Nostrand's Engineering Magazine, June, 1873.
Extract from report of Committee of Civ. Engs. appointed by Franklin Inst. to examine H. & B's new Transit: [Dec. 1871.] "It exhibits several novelties of construction which, in the opinion of the committee, render it superior to those now in use, and in its opinion the deviation which they have made from the common styles of Transit are decided improvements."
JOHN C. TRAUTWINE, Chairman.
TRADE MARK.

REG. JUNE 27, 1871.

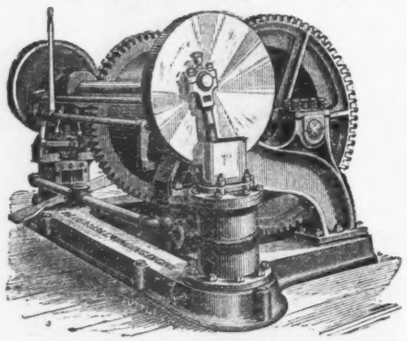

B. F. STURTEVANT'S
PATENT IMPROVED
PRESSURE BLOWER,
FOR CUPOLA FURNACES AND FORGES.
Also manufacturer of the Sturtevant Patent Improved Fan Blower and Exhaust Fan. Send for illustrated catalogue.
B. F. STURTEVANT, 72 Sudbury street, Boston, Mass.
n29:1y

NASON'S VERTICAL TUBE RADIATORS

IN VARIOUS SIZES AND PATTERNS.
THE NASON MANUFACTURING CO., 61 Beekman street, corner of Gold street.—WROUGHT and CAST-IRON PIPES; all kinds of STEAM and GAS FITTINGS; Apparatus for WARMING and VENTILATING BUILDINGS. HENRY R. WORTHINGTON, Prest.
C. W. NASON, Vice-Prest. W. S. LEDYARD, Treas.

COOPER'S GLUE AND REFINED GELATINE
COOPER, HEWITT & CO.,
NO. 17 BURLING SLIP, NEW YORK.
Bar Iron, Braziers' Rods, Wire Rods, Rivet and Machinery Iron, Iron and Steel,
Wire of all Kinds, Copperas,
&c, &c.
RAILROAD IRON, COOPER WROUGHT IRON, BEAMS AND GIRDERS,
Martin Cast-Steel, Gun-Barrel and Component Iron,
PUDDLED AND REFINED CHARCOAL BLOOMS,
Ringwood Anthracite and Charcoal Pig Iron
Works at Trenton and Ringwood, N. J.
may 17:1y

ARTHUR VON BRIESEN
SOLICITOR OF AMERICAN AND FOREIGN PATENT
258 BROADWAY, (Cor. Warren St.,)
ATTORNEY & COUNSELLOR AT LAW IN PATENT CASES. NEW YORK.
All orders promptly attended to. Information gratis.

BACON'S
HOISTING ENGINES
FOR MINES AND QUARRIES,



STEVEDORES, CONTRACTORS, ETC.
20 different styles, adapted to every possible duty.
Portable and Stationary
ENGINES.
BOILERS OF ALL KINDS,
Copeland's Wire Rope and Mining Machinery.
COPELAND & BACON,
feb. 7:3m M'f'rs, 85 Liberty st., New York.

MINING MACHINERY.
MOREY & SPERRY,
88 Liberty St., New York.

Steel Shoes & Dies,

Made by our improved process. After many years of patient research and experiment, we have succeeded in producing STEEL SHOES AND DIES FOR QUARTZ MILLS, which are unequaled for strength, durability, and economy; will wear three times longer than any iron shoes. We manufacture, and contract to erect Gold and Silver Reducing and Amalgamating Machinery in all its details. Pans, Separators, Concentrators, Jigs, Rock Breakers, and Furnaces. *Furnishers of Mining Supplies.* All Orders promptly filled. Examinations solicited.

MOREY & SPERRY.

☞ Look at following extract, Ingersoll Co.'s letter of excuses, ENGINEERING AND MINING JOURNAL, June 6, and compare with their advertisement: "I had *two* drills at the mine from the commencement, one beginning work on the 4th of April, the other on the 7th of the same month, and both drills working until the 1st of May." Signed, C. N. ELLIOTT, Superintendent Ingersoll Rock Drill Co.
RAND & WARING D. & C. CO.

MORRIS, TASKER & CO.,
PASCAL IRON WORKS
PHILADELPHIA.
TASKER IRON WORKS,
NEWCASTLE, DELAWARE.

Office.....FIFTH AND TASKER STREETS, PHILADELPHIA.
Office and Warehouse.....No. 15 GOLD STREET, NEW YORK.
Office and Warehouse.....No. 36 OLIVER STREET, BOSTON.

Manufacturers of Wrought Iron Welded Tubes, plain, galvanized and *rubber coated*, for gas, steam and water. Lap-Welded Charcoal Iron Boiler Tubes, Oil-Well Tubing and Casing, Gas and Steam Fittings, Brass Valves and Cocks, Gas and Steam Fitters' Tools, Cast Iron Gas and Water Pipe, Street Lamp Posts and Lanterns, Improved Coal Gas Apparatus, Improved Sugar Machinery, &c.

We would call Special Attention to our Patent Vulcanized Rubber-Coated Tube.
THOMAS T. TASKER, JR. STEPHEN P. M. TASKER.

RAND AND WARING
DRILL AND COMPRESSOR COMPANY.
21 Park Row, Opposite New Post Office,
NEW YORK.

Send for Circulars.

Actual Work done at trial at Port Henry Mine.

		Rand.	*Ingersoll.*	*Waring.*
First Week,	feet,	459½	288	[illegible]
Second "	"	459	257	136
		918½	545	136

AIR COMPRESSORS
THE COMPRESSED AIR POWER CO.
OFFICE & WAREHOUSE 5 PARK PLACE N.Y.
SEND FOR DESCRIPTIVE LIST.

Cazin's Combination Ore-Sizer and Concentrator One-Plunger System.

Covered by letters patent of July 2d, 1872, and recent application. Containing a sizing apparatus (revolving screen) delivering two or four sizes of ore to two or four rows of sieves, each row independent of the other, and each having 5 sieves, each row concentrating according to specific gravity, the special size of ores automatically fed into it, resulting in the simultaneous continual delivery of thoroughly separated materials, working 2d and 3d class ores into 1st class ores of perfect cleanness. It thoroughly separates native gold or copper from quartz or any other lode matter; galena and silver sulphurets from pyrites, baryta and quartz—and pyrites from quartz.

Added to a battery of stamps the machines constitute a full system of ore-concentration sufficient, in most cases, for the requirements of Western mines with a capacity of 15 to 20 tons per 24 hours. For particulars apply to **F. CAZIN,** M. and C. E., at Denver, Colorado. Lock Box 2225, Cor. Birke and 32d street.

THE INGERSOLL
ROCK DRILL CO.
5 PARK PLACE, N.Y.
OFFER THEIR MACHINES ON TRIAL AND CLAIM 40 PR. CT. INCREASED POWER OVER ANY DRILL IN EXISTENCE.
SEND FOR CATALOGUE.

Comparison of Rock Drills at Port Henry Mines, New York.

First week with **ONE** Ingersoll drill.....288 feet.
Second week " " " " .....257 "
545 "
First week with **THREE** Rand drills.....459½ ft.
Second week " " " " .....459 "
918½ ft

WARING'S IMPROVED SELF-FEEDING
ROCK DRILL,

By far the most simple and effective machine for all descriptions of mining, railroad, and quarry work.

GEO. H. REYNOLDS, in his report of the trial of the Rand, Ingersoll and Waring Rock Drills, at the Port Henry Iron Ore Company's Mines, at Mineville, N. Y., April 20, 1874, states that one hole was drilled by the Waring Drill that could not be reached by either of the other machines, and undoubtedly the mounting of this drill for all purposes of varying work is far superior to either of the others. The experiment is conclusive and satisfactory. Also Dealers in

AIR COMPRESSORS, PUMPS, &c.
WARING ROCK DRILL CO.,
187 Broadway, New York,
Street Level, (Rear).

Diamond-Pointed ROCK DRILLS

Recent improvements in connection with the celebrated LESCHOT'S patents have increased the adaptability of these drills to every variety of ROCK DRILLING. Their use, both in this country and in Europe, has sufficiently established their reputation for efficiency and economy, over any other now before the public.

The Drills are built of various sizes and patterns, WITH and WITHOUT BOILERS, and bore at a uniform rate of THREE TO FIVE INCHES PER MINUTE in hard rock.

They are adapted to CHANSELLING, GADDING, SHAFTING, TUNNELLING and open cut work, also to DEEP BORING for TESTING the VALUE of MINES and QUARRIES. TEST ORES taken out, show the character of mines at any depth. Used either with steam or compressed air. Simple and durable in construction and never need sharpening.

Manufactured by
THE AMERICAN DIAMOND DRILL CO.,
No. 61 Liberty street,
jan31 New York.

Z. B. HEYWOOD & CO., Dealers in Hose, Belting, Packing, and all other kinds of Rubber Goods
303 CANAL STREET, NEW YORK.